RESULTS AND DISCUSSION

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This study was designed to find out some factors which affect seed ma turty, germination percentage, germination rate and germination periodicity as well as seedling growth.

The results are presented in two separated parts, the first part included the effect of pre-germination treatments on seeds. Seeds were subjected to soaking in different solutions for ***Albizzia lebbeck*** **Benth.** and ***Taxodium destichum*** **(L.) Rich.**. The second part was to study the effect of seed collection date for ***Albizzia lebbeck*** **Benth.,** ***Taxodium distichum*** **(L.) Rich.** and ***Cupressus sempervirens*** **L.** on germination and seedling growth.

*A.*The first part:-

A- *Albizzia lebbeck* Benth .

A-1.Effect of potassium nitrate (KNO_3) [nutrition]; thiourea (thiocarbamide CH_4N_2S) and yeast extract on the germination percentage; rate and periodicity of *Albizzia lebbeck* Benth. during 1999/2000 and 2000/2001 seasons:

A-1-1. Germination percentage (%):-

Table (2) and Fig. (1) represent the germination percentage of ***Albizzia lebbeck*** as affected by the different treatments. In the two seasons, all treatments gave higher germination percentage as compared to control. The highest percentage of germination resulted from soaking the seeds in KNO_3 (nutrition) at 1000 p.p.m. and yeast extract at 5000 p.p.m. with the means of 85.00 and 80.00% for the first season and

Table (2):- Effect of potassium nitrate (KNO_3) [nutrition]; thiourea (thiocarbamide CH_4N_2S) and yeast extract on the germination percentage; rate and periodicity of *Albizzia lebbeck* Benth. during 1999/2000 and 2000/2001 seasons.

Seasons		1999/2000			2000/2001		
Treatments (p.p.m.)		Germination percentage (%)	Germination rate	Germination periodicity (days)	Germination percentage (%)	Germination rate	Germination periodicity (days)
Control		44.00	10.88	24.73	41.20	10.55	25.61
KNO_3:	1000	85.00	19.28	22.68	78.60	16.36	20.81
	5000	59.00	12.66	21.46	58.20	11.55	19.85
	10000	53.00	13.71	25.87	49.60	12.67	25.54
Thiourea:	1000	53.00	9.54	18.00	49.00	8.71	17.78
	3000	60.00	14.65	24.42	59.80	15.43	25.80
	5000	58.00	14.60	25.17	53.20	13.31	25.02
Y.E.:	1000	65.00	15.66	24.09	63.40	15.17	23.93
	3000	64.00	15.15	23.67	63.60	15.00	23.59
	5000	80.00	14.92	18.65	73.80	13.54	18.35
	7000	63.00	16.85	26.75	62.40	16.67	26.72
L.S.D. at 5%		13.42	1.42	3.07	10.97	1.83	2.83

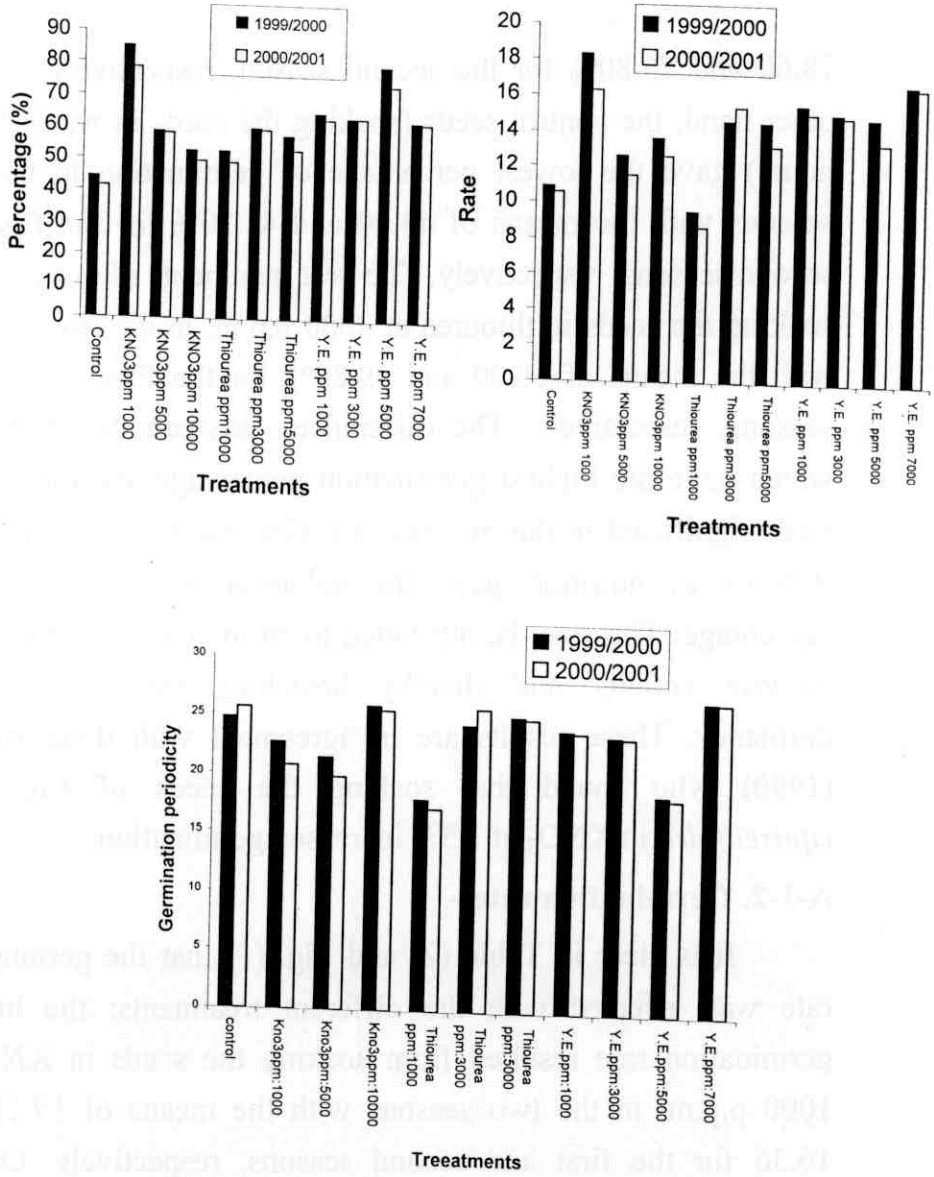


Figure (1): Effect of potassium nitrate (KNO_3) [nutrition], thiourea (thiocarbamide CH_4N_2S) and yeast extract on germination percentage, rate and periodicity of *Albizzia lebbeck* (L.) Benth. during 1999/2000 and 2000/2001 seasons.

78.60 and 73.80% for the second season, respectively. On the other hand, the control seeds (soaking the seeds in water for 24 hours) gave the lowest percentage of germination in the two seasons with the means of 44.00 and 41.20% for the first and second seasons, respectively. The best treatments of thiourea was soaking the seeds in thiourea at 3000 p.p.m. in the two seasons, with the means of 60.00 and 59.80% for the first and second seasons, respectively. The differences between the treatments which gave the highest germination percentage and the control were significant in the two seasons. Generally, potasium nitrate (KNO_3) as nutrition gave the enhancement in gremination percentage. This may be attributed to an increase in cytochrome oxidose activity and thereby breacking the post harvest dormancy. These results are in agreement with those of **Rai (1990)** who found that soaking the seeds of *Casuarina equisetifolra* in KNO_3 at 1.5% increased germination.

A-1-2. Germination rate:-

It is clear in Table (2) and Fig. (1) that the germination rate was affected with the different treatments; the highest germination rate resulted from soaking the seeds in KNO_3 at 1000 p.p.m. in the two seasons with the means of 19.28 and 16.36 for the first and second seasons, respectively. On the contrary, the lowest germination rate was obtained from soaking the seeds in thiourea at I000 p.p.m. in the two seasons, with the means of 9.54 and 8.71 for the first and second seasons, respectively. Soaking the seeds in thiourea at 3000 p.p.m. gave the highest germination rate for thiourea treatments in the two seasons with the means of 14.65 and 15.43 for the first and

second seasons, respectively. However, the highest germination rate of yeast extract treatments resulted from soaking the seeds in yeast extract at 7000 p.p.m. in the two seasons with the means of 16.85 and 16.67 for the first and sacond seasons, respectively. The differences between the treatments which gave the highest rate and the lowest rate were significant in the two seasons. These results are in agreement with these of **Row (1992)** on *Albizzia lebbeck* who found that thiourea had the highest effect on germination rate

A-1-3. Germination periodicity (days) :-

As shown in Table (2) and Fig. (1) in the two seasons, the fastest germination periodicity resulted from soaking the seeds in thiourea at 1000 p.p.m. with the means of 18.00 and 17.78 days for the first and sacond seasons, respectively. On the contrary, the slowest germination periodicity was obtained from soaking the seeds in KNO_3 at 10000 p.p.m. in the first season and 3000 p.p.m. thiourea in the second season with the means of 25.87 and 25.80 days for the first and sacond seasons, respectively. Soaking the seed in potassium nitrate (KNO_3) at 5000 p.p.m. gave the fastest germination periodicity for this chemical with the means of 21.46 and 19.85 days for the first and second seasons, respectively. The fastest germination periodicity of treatments yeast extract resulted from soaking the seeds in yeast extract at 5000 p.p.m. in the two seasons with the means of 18.65 and 18.35 days for the first and second seasons , respectively. The differences between the treatments which gave the highest and the lowest germination periodicity were significant in the two seasons.

These results are in agreement with these of **Mukhopadhyay *et al.* (1990)** who found that soaking the seeds of *Peltophorum ferrugenium* in solutions of thiourea (both at 0.1, 0.5 and 1%) for 6, 12 or 24h. increased percentage of germination over that of the control (6.6- 13.2% in the immediately sown seeds) with thiourea at 0.1% for 6 or 12h (26.66%). Also, **Sudhir *et al.* (2000)** on *Moringa oleifera* seeds, found that germination started after 4 days and lasted to 9 days, with maximum germination on day 5. Maximum height and branch growth were significantly lower in the thiourea treatment.

A-2. Effect of potassium nitrate (KNO_3) [nutrition] ; thiourea (thiocarbamide CH_4N_2S) and yeast extract on the growth of *Albizzia lebbeck* Benth. seedlings at age of 9 months after sowing during 1999/2000 and 2000/2001 seasons:-

A-2-1. Plant height (cm):-

The plant height was affected with the different pre-germination treatments as shown in Table (3) and Fig. (2). The tallest seedling resulted from soaking the seeds in KNO_3 at 1000 p.p.m. and thiourea at 3000 p.p.m. in the two seasons with the means of 29.35 and 29.22cm. for the first season and 34.44 and 34.31cm for the second season, respectively. On the other hand, in the two seasons, the control (soaking the seeds in water for 24 hours) gave the shortest seedlings with the means of 21.75 and 29.00 cm for the first and second season, respectively. The best treatment of yeast extract was soaking the seeds in yeast extract at 3000 p.p.m.. in both seasons, with means of 26.30 and 33.22

Table (3):- Effect of potassium nitrate (KNO_3) [nutrition]; thiourea (thiocarbamide CH_4N_2S) and yeast extract on the growth of *Albizzia lebbeck* Benth. seedlings at age of 9 months after sowing during 1999/2000 and 2000/2001 seasons.

Seasons		1999/2000				2000/2001			
Treatments (p.p.m.)		Plant height/ plant (cm)	Number of leaves/ plant	Thickness of stem/plant (mm)	Root length/ plant (cm)	Plant height/ plant (cm)	Number of leaves/ plant	Thickness of stem/plant (mm)	Root length/ plant (cm)
Control		21.75	25.40	3.35	39.59	29.00	24.92	4.28	43.14
KNO_3:	1000	29.35	35.26	4.64	45.23	34.44	31.77	4.76	53.99
	5000	26.32	29.60	4.33	49.01	33.60	29.95	5.06	48.94
	10000	24.65	26.68	4.03	44.94	33.51	31.74	4.64	49.39
Thiourea:	1000	24.43	26.63	3.93	45.40	32.90	26.63	4.60	47.13
	3000	29.22	32.07	4.65	47.44	34.31	31.67	4.67	55.00
	5000	26.69	28.22	4.16	44.41	33.70	28.41	4.51	54.57
Y.E.:	1000	24.84	28.23	3.87	43.33	32.82	28.33	4.52	50.54
	3000	26.30	29.45	4.23	42.42	33.22	29.33	4.34	51.42
	5000	25.58	26.74	4.16	43.59	32.58	28.75	4.37	50.49
	7000	24.67	25.47	3.85	42.29	31.58	27.63	4.27	49.53
L.S.D. at 5%		1.25	0.28	0.04	1.37	1.49	1.88	0.21	2.89

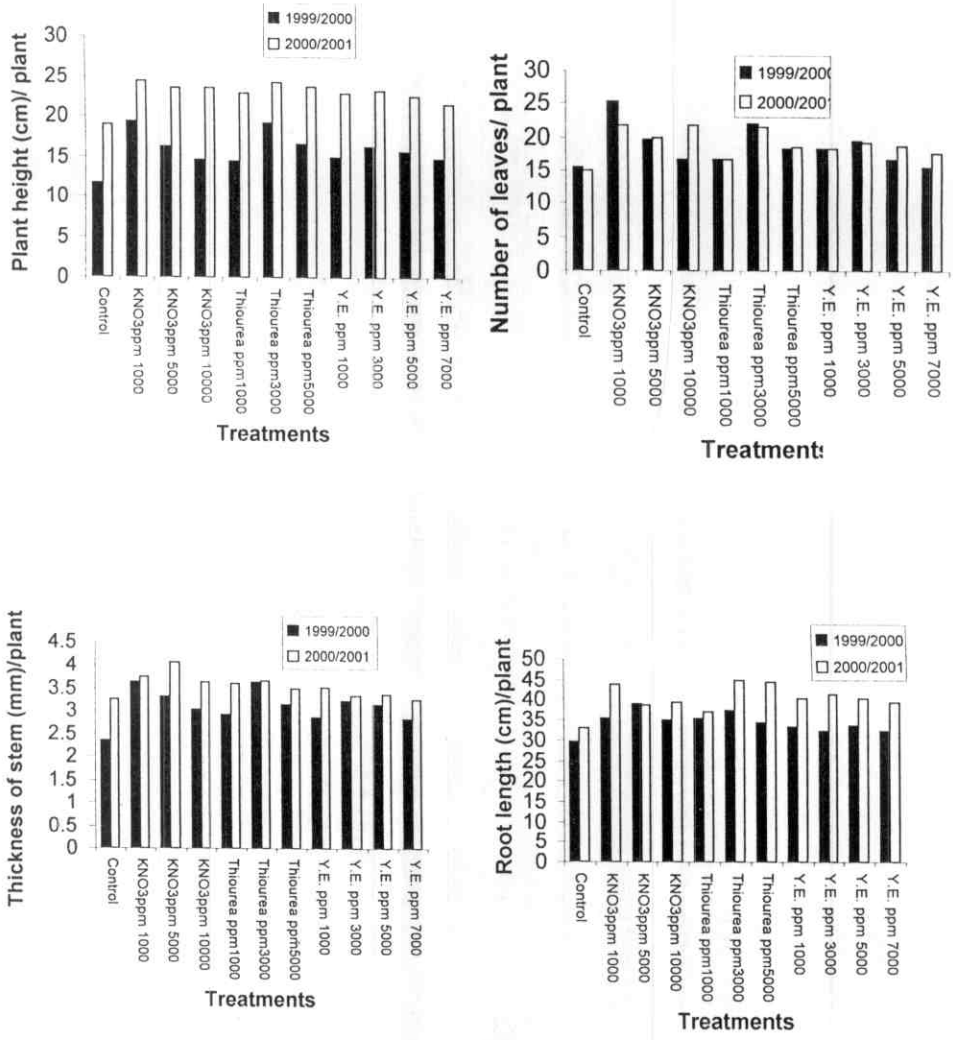


Figure (2):Effect of potassium nitrate (KNO_3) [nutrition]; thiourea (thiocarbamide CH_4N_2S) and yeast extract on the growth of *Albizzia lebbeck* Benth. seedlings at age of 9 months after sowing during 1999/2000 and 2000/2001 seasons.

cm for first and second season, respectively. The differences between the treatments which gave the tallest seedlings and the control were significant in the two seasons. These results are in agreement with these of **Row (1992)** on *Albizzia labbeck* Benth. who found that soaking the seeds in potassium nitrate (KNO_3) and thoiurea gave better growth of seedlings specially with soaking the seeds in KNO_3 at 0.3% and soaking the seeds in thiourea at 0.2%.

A-2-2. Number of leaves/plant:-

It is clear from Table (3) and Fig.(2) that, number of leaves was affected with the different pre-germination treatments. The largest numbers of leaves resulted from soaking the seeds in KNO_3 at 1000 p.p.m. and thiourea at 3000 p.p.m. with the means of 35.26 and 32.07 leaves/plant for the first season, respectively. However, in the second season, the largest numbers of leaves were produced from soaking the seeds in KNO_3 at I000 p.p.m., KNO_3 at 3000 p.p.m. and thiourea at 3000 p.p.m. with the means of 31.77, 31.74 and 31.67 leaves/plant for the second season, respectively. On the other hand, in the two seasons, the minimum number of leaves was obtained from the control with the means of 25.40 and 24.92 leaves/plant for the first and second season, respectively. The largest numbers of leaves in yeast extract treatments resulted from soaking the seeds in yeast extract at 3000 p.p.m. with the means of 29.45 and 29.33 leaves/plant for the first and second seasons. The differences among the treatments which gave the largest number of leaves and the control were significant in the two seasons. This means that the potasium nitrate increased the cell division and increased

development of tissues so the treatment of 1000 p.p.m. was effective, as these results are in accordance with those of **Row (1992)** on *Albizzia lebbeck* Benth.

A-2-3. Thickness of stem (mm):-

The different pre-germination treatments affected the thickness of stems as shown in Table (3) and Fig. (2). The thickest seedlings resulted from soaking the seeds in thiourea at 3000 p.p.m. and KNO_3 at 1000 p.p.m. in the first season with the means of 4.65 and 4.64 mm respectively. In the second season, soaking the seeds in KNO_3 at 5000 p.p.m. gave the thickest seedlings with the mean of 5.06 mm. On the other hand, the thinnest seedlings as 3.35 mm in the first season was from control. However, in the second season, treating the seeds with 7000 p.p.m. yeast extract and the control gave the thinnest seedlings with the means of 4.27 and 4.28 mm, respectively. The best treatment of yeast extract which gave the thickset seedlings was soaking the seeds in yeast extract at 3000 p.p.m. with the mean of 4.23 mm in the first season and soaking the seeds in yeast extract at 1000 p.p.m. with the mean of 4.52 mm in the second season, respectively. The differences between the treatments which gave the thickest seedlings and the thinnest seedlings were significant in the two seasons.

A-2-4. Root length (cm):-

Table (3) and Fig. (2) show that the tallest roots were obtained from soaking the seeds in KNO_3 at 5000 p.p.m. as nutrient and thiourea at 3000 p.p.m. in the two seasons, with the means of 49.01 and 47.44 cm for the first season and with the means of 53.99 and 55.00 cm for the second season. On the other

hand, in the two seasons, the control (soaking the seed in water) gave the shortest roots with the means of 39.59 and 43.14 cm for the first and second season, respectively. The best treatment of yeast extract which gave the tallest roots was soaking the seeds in 5000 p.p.m. with the mean of 43.59 cm for the first season and soaking the seed in 3000 p.p.m. yeast extract with the mean of 51.42 cm for the second season. The differences between the treatments which gave the tallest roots and the shortest roots were significant in the two seasons.

Generally, from the above data the nutrition application with potassium nitrate (KNO_3) at 1000 p.p.m on *Albizzia lebbeck* Benth. for 24 hours enhanched the vegetative growth of seedlings and produced the tallest plants with largest stem thickness with maximum leaves number/seedling. These results agree with the findings of **Row (1992)** on *Albizzia lebbeck* Benth.; **Masilamami and Vadivelu (1997 a)** on *Hardwickia binata* and **Murugesh *et al.* (1998)** on *Emblica officinalis*, as they concluded that potassium nitrate (KNO_3) treatments as nutrient solution gave the highest seedlings vigour.

A-3. Effect of potassium nitrate (KNO_3) [nutrition] ; thiourea (thiocarbamide CH_4N_2S) and yeast extract on the fresh weight of *Albizzia lebbeck* Benth. seedlings at age 9 months after sowing during 1999/2000 and 2000/2001 seasons:-

A-3-1. Fresh weight of the stem (gm):-

It is clear from Table (4) and Fig. (3) that the fresh weight of the stem was affected with the different treatments; the heaviest fresh weight of the stem resulted from soaking the seeds

Table (4):- Effect of potassium nitrate (KNO_3) [nutrition]; thiourea (thiocarbamide CH_4N_2S) and yeast extract on the fresh weight (gm) of *Albizzia lebbeck* Benth. seedlings at age of 9 months after sowing during 1999/2000 and 2000/2001 seasons.

Seasons		1999/2000			2000/2001		
Treatments (p.p.m.)		Fresh weight (g/plant)			Fresh weight (g/plant)		
		Stem	Leaves	Roots	Stem	Leaves	Roots
Control		4.43	5.09	5.16	5.45	6.48	6.49
KNO_3:	1000	5.45	6.97	6.52	6.38	7.62	7.24
	5000	5.06	5.74	6.11	5.95	7.64	7.64
	10000	4.91	5.66	5.52	5.92	7.86	6.61
Thiourea:	1000	4.65	5.33	5.26	6.15	7.50	7.32
	3000	5.57	7.00	6.77	6.68	7.95	7.83
	5000	5.16	6.02	5.72	6.20	7.38	7.55
Y.E.:	1000	4.89	5.80	5.73	5.94	7.66	6.82
	3000	5.06	5.99	5.80	5.60	7.60	6.76
	5000	5.01	5.87	6.63	5.75	7.46	6.63
	7000	4.75	5.45	5.51	5.57	7.40	6.51
L.S.D. at 5%		0.11	0.24	0.21	0.21	0.36	0.31

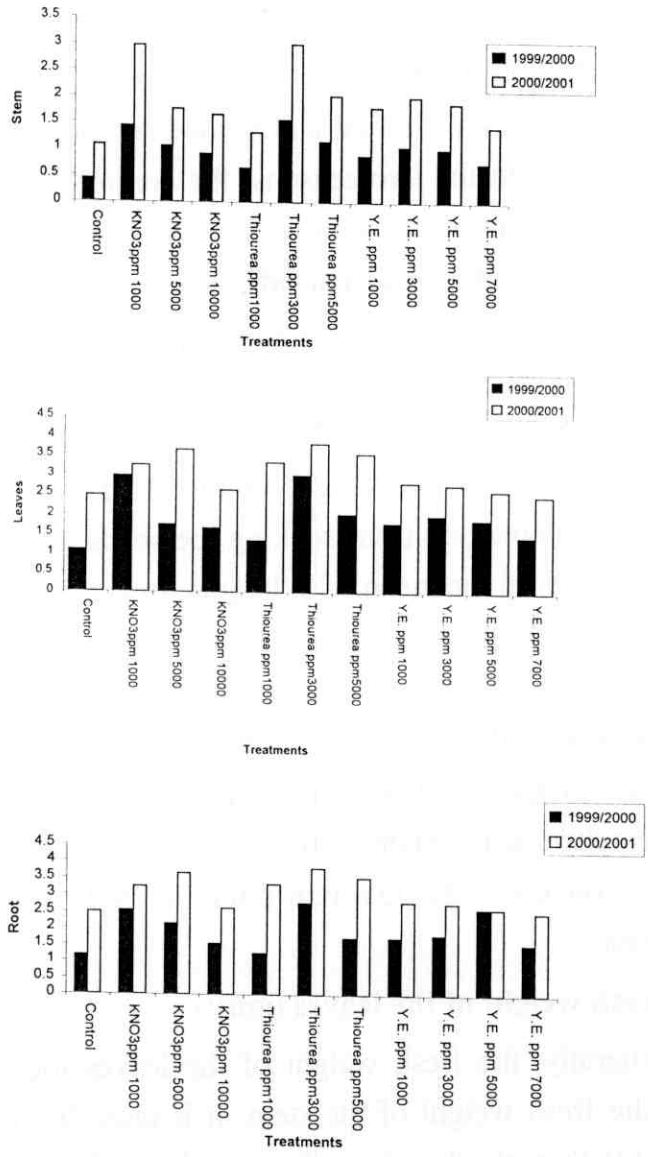


Figure (3):Effect of potassium nitrate (KNO_3) [nutrition]; thiourea (thiocarbamide CH_4N_2S) and yeast extract on the fresh weight (gm) of *Albizzia lebbeck* Benth. at age of 9 month after sowing during 1999/2000 and 2000/2001 seasons.

in thiourea at 3000 p.p.m. in the two seasons with the means of 5.57 and 6.68 gms for the first and second seasons, respectively. On the contrary, in the two seasons, the control seeds gave the lightest fresh weight of the stem with the means of 4.43 and 5.45 gm for the first and second seasons, respectively. The heaviest fresh weight of the stems in potassium nitrate (KNO_3) treatments resulted from soaking the seeds in KNO_3 at 1000 p.p.m. with the means of 5.45 and 6.38 gms for the first and second season. While, the heaviest fresh weight of the stem in yeast extract treatments was obtained from soaking the seeds in yeast extract at 3000 p.p.m. with the mean of 5.06 gms for the first season and soaking the seeds in yeast extract at 1000 p.p.m. with the mean of 5.94 gms for the second season. The differences between all the treatments and the control were significant in the two seasons. This means that these results are in line with those of other researchers who obtained increased fresh weight of stem of seedlings produced with potasium nitrate (KNO_3), thiourea and yeast extract.

A-3-2. Fresh weight of the leaves (gm):-

Generally, the fresh weight of the leaves took a similar trend as the fresh weight of the stem. It is clear from Table (4) and Fig. (3) that, the heaviest fresh weight of the leaves was obtained from soaking the seeds in the thiourea at 3000 p.p.m. in the two seasons, with the means of 7.00 and 7.95 gms for the first and second season, respectively. On the other hand, the lightest fresh weight of the leaves resulted from the control with the means of 5.09 and 6.48 gms for the first and second seasons, respectively. The best fresh weight of the leaves with potassium

nitrate (KNO_3) treatments resulted from soaking the seeds in KNO_3 at 1000 p.p.m. with the mean of 6.97 gms for the first season and soaking the seeds in KNO_3 at 10000 p.p.m. with the mean of 7.86 gms for the second season. While, the best fresh weight of the leaves in yeast extract treatments resulted from soaking the seeds in yeast extract at 3000 p.p.p. with the mean of 5.99 gms for the first season and soaking the seeds in yeast extract at 1000 p.p.m. with the mean of 7.66 gms for the second season. The differences between all the treatments and the control were significant in the two seasons.

The reason may be due the noticeable efficiency of these treatments on nutrition; promoting and hastening seed germination which reflected on seedlings growth as mentioned by **Masilamani and Vadivelu (1997 a)** on *Hardwickia binata* Roxb. who found that the seeds treated with potasium nitrate (KNO_3) at 2% gave seedling with high vigour.

A-3-3. Fresh weight of the roots (gm):-

Generally, the fresh weight of the roots took a similar trend as the fresh weight of the stem and fresh weight of the leaves. From Table (4) and Fig. (3), it is clear that the fresh weight of the roots was affected with the different treatments. The heaviest fresh weight of the roots was produced from soaking the seeds in thiourea at 3000 p.p.m. with means of 6.77 and 7.83 gms for the first and second season, respectively. On the contrary, the lightest fresh weight of the roots resulted from the control in the two seasons, with the means of 5.16 and 6.49 gms for the first and second season, respectively. The best fresh weight of the roots in potassium nitrate (KNO_3) treatments

resulted from soaking the seeds in KNO_3 at 1000 p.p.m. with the mean of 6.52 gms for the first season and soaking the seeds in KNO_3 at 5000 p.p.m. with the mean of 7.64 gms for the second season. While, the best fresh weight of the roots from the yeast extract treatments resulted from soaking the seeds in yeast extract at 5000 p.p.m. with the mean of 6.63 gms for the first season and 1000 p.p.m. with the mean of 6.82 gms for the second season. The differences between the treatments which gave the heaviest fresh weight of the roots and the control were highly significant in the two seasons. Generally, the thiourea treatment at 3000 p.p.m. significantly gave the heaviest fresh weight of the roots compared to the control which gave the lightest fresh weight of roots. These results agree with those of **Dhankhar and Santosh (1996)** on *Phyllanthus emblica* L. who found that the thiourea treatments gave the highest number of roots being obtained in the 750 p.p.m. treatment.

A-4. Effect of potassium nitrate (KNO_3) [nutrition]; thiourea (thiocarbamide CH_4N_2S) and yeast extract on the dry weight of *Albizzia lebbeck* Benth. seedlings at age of 9 months after sowing during 1999/2000 and 2000/2001 seasons:-

A-4-1- Dry weight of the stem (gm):-

Data concerning the effect of various soaking treatments on dry weight of the stem are presented in Table (5) and Fig. (4) for the two seasons. It is clear that the heaviest dry weight of the stem resulted from soaking the seeds in thiourea at 3000 p.p.m. with the mean of 1.72 gm for the first season. While, in the second season, the heaviest dry weight of the stems resulted

Table (5):- Effect of potassium nitrate (KNO_3) [nutrition]; thiourea (thiocarbamide CH_4N_2S) and yeast extract on the dry weight (gm) of *Albizzia lebbeck* Benth. seedlings at age of 9 month after sowing during 1999/2000 and 2000/2001 seasons.

Seasons		1999/2000			2000/2001		
Treatments (p.p.m.)		Dry weight (g/plant)			Dry weight (g/plant)		
		Stem	Leaves	Roots	Stem	Leaves	Roots
Control		1.25	1.45	2.64	1.71	1.57	3.30
KNO_3:	1000	1.65	1.96	3.33	2.33	2.03	3.68
	5000	1.33	1.76	3.03	1.94	2.06	4.21
	10000	1.25	1.57	2.73	1.83	2.09	3.33
Thiourea:	1000	1.37	1.54	2.59	2.11	1.84	3.54
	3000	1.72	2.06	3.40	1.94	2.09	4.52
	5000	1.52	1.76	3.44	2.56	2.64	4.34
Y.E.:	1000	1.43	1.77	2.99	1.84	2.75	3.41
	3000	1.55	1.85	3.07	1.85	2.86	3.69
	5000	1.44	1.69	3.43	1.82	2.67	3.52
	7000	1.37	1.62	2.90	1.78	2.62	3.46
L.S.D. at 5%		0.04	0.06	0.17	0.20	0.14	0.20

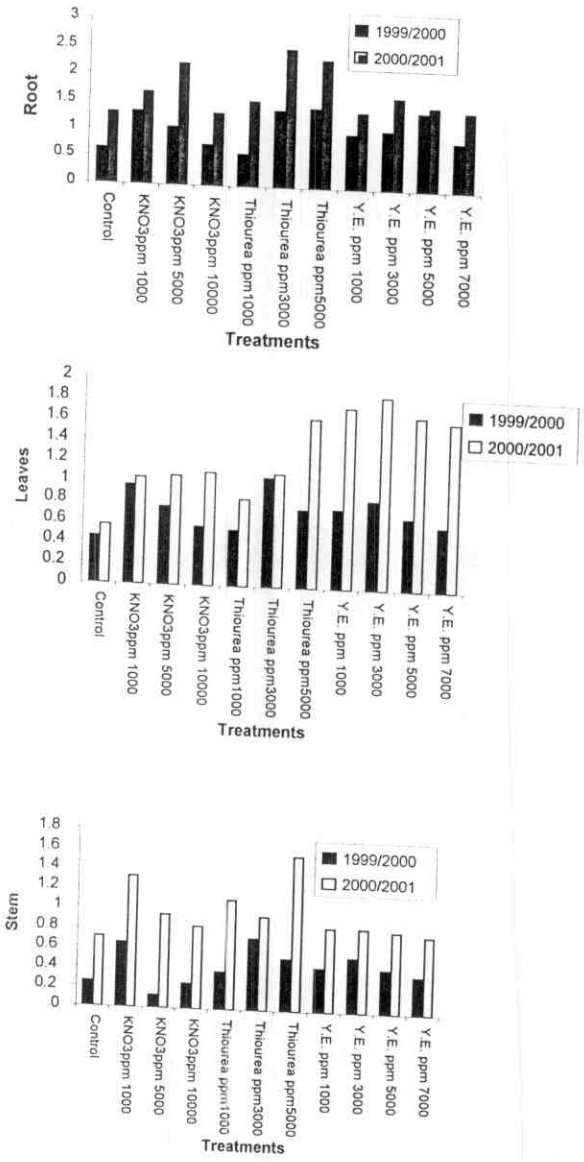


Figure (4):Effect of potassium nitrate (KNO_3) [nutrition], thiourea (thiocarbamide CH_4N_2S) and yeast extract on the dry weight (gm) of *Albizzia lebbeck* Benth. seedlings at age of 9 month after sowing during 1999/2000 and 2000/2001 seasons.

from soaking the seeds in thiourea at 5000 p.p.m. with the mean of 2.56 gm. On the other hand, the lightest dry weight of the stems resulted from the control and soaking the seeds in KNO_3 (potassium nitrate) at 10000 p.p.m with the means of 1.25 gm for each in the first season and the control with the mean of 1.71 gm for the second season. The best dry weight of the stem from potassium nitrate (KNO_3) treatments resulted from soaking the seeds in KNO_3 at 1000 p.p.m. in the two seasons, with the means of 1.65 and 2.33 gm for the first and second season, respectively. While, seeds in yeast extract at 3000 p.p.m. in the two seasons, gave the best dry weight of the stems in yeast extract treatments with the means of 1.55 and 1.85 gm for the first and second season, respectively. The differences among the treatments which gave the heaviest dry weight of the stem and the lightest dry weight of the stems were significant in the two seasons.

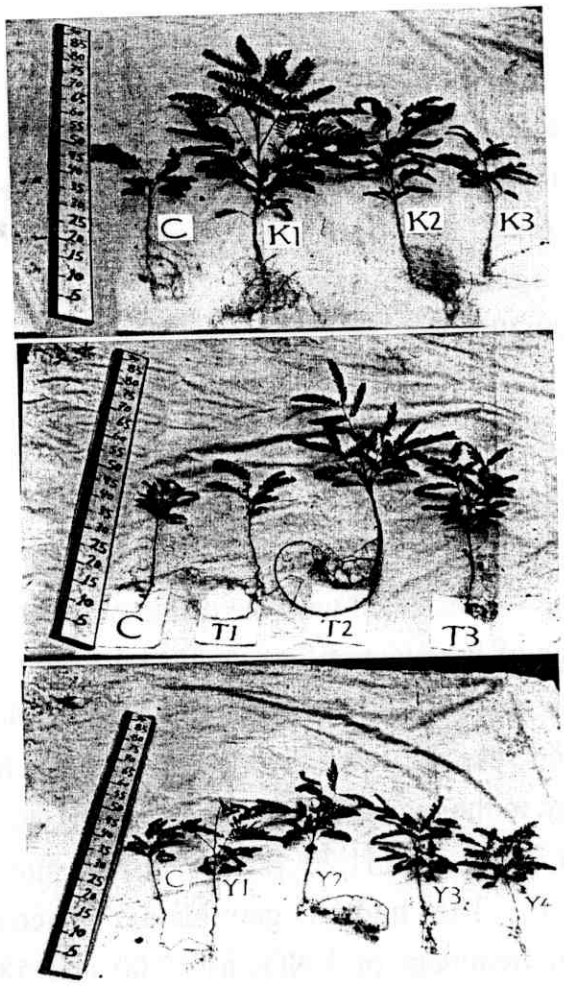
A-4-2. Dry weight of the leaves (gm):-

As shown in Table (5) and Fig. (4), the dry weight of the leaves was markedly affected by the different treatments. The heaviest dry weight of the leaves resulted from soaking the seeds in thiourea at 3000 p.p.m. with the mean of 2.06 gm for the first season and soaking the seeds in yeast extract at 3000 p.p.m. with the mean of 2.86 gm for the second season. On the other hand, in the two seasons, the control gave the lightest dry weight of the leaves with the means of 1.45 and 1.57 gm for the first and second season, respectively. The best dry weight of the leaves in potassium nitrate (KNO_3) treatments resulted from soaking the seeds in KNO_3 at 1000 p.p.m. with the means of 1.96 gm for the first season and soaking the seeds in KNO_3 at 10000 p.p.m. with

the mean of 2.09 gm for the second season. While, the heaviest dry weight of the leaves from the yeast extract in the two seasons resulted from soaking the seeds in 3000 p.p.m. with the mean of 1.85 and 2.86 gm for the first and second seasons, respectively. The differences between all treatments and the control were significant in both seasons.

A-4-3. Dry weight of the roots (gm):-

From Table (5) and Fig. (4) it is clear that the heaviest dry weight of the roots was produced from soaking the seeds in thiourea at 5000 p.p.m. with the mean of 3.44 gm for the first season and soaking the seeds in thiourea at 3000 p.p.m. with the mean of 4.52 gms in the second season. On the other hand, the control and soaking the seeds in thiourea at 1000 p.p.m. gave the lightest dry weight of the roots with the means of 2.64 and 2.59 gm respectively in the first season. While, in the second season, the control gave the lightest dry weight of the roots with the mean of 3.30 gm. The best dry weight of the roots from potassium nitrate (KNO_3) treatments resulted from soaking the seeds in KNO_3 at 1000 p.p.m. with the mean of 3.33 gm in the first season and soaking the seed in KNO_3 at 5000 p.p.m. with the mean of 4.21 gms in the second season. While, the heaviest dry weight of the roots from the yeast extract treatments was obtained from soaking the seeds in 5000 p.p.m. which gave 3.43 gm in the first season and in 3000 p.p.m. with the mean of 3.69 gm in the second season. The differences between the different treatments which gave the heaviest dry weight of the roots and the lightest dry weight of the roots were significant in the two seasons.



Photog.(5):- Effect of potassium nitrate (KNO_3) [nutrition]; thiourea (thiocarbamide CH_4N_2S) and yeast extract on the growth of *Albizzia lebbeck* Benth. seedlings at age of 9 months after sowing during 1999/2000 and 2000/2001 seasons.

***C*:** Control

***K1*:** KNO_3 at 1000 p.p.m. ***K2*:** KNO_3 at 5000 p.p.m. ***K3*:** KNO_3 at 10000 p.p.m.

***T1*:** Thiourea at 1000p.p.m. ***T2*:** Thiourea at 3000p.p.m. ***T3*:** Thiourea at 5000p.p.m.

***Y1*:** Yeast extract at 1000p.p.m. ***Y2*:** Yeast extract at 3000p.p.m.

***Y3*:** Yeast extract at 5000p.p.m. ***Y4*:** Yeast extract at 7000p.p.m.

B- *Taxodium distichum* (L.) Rich.

B-1. Effect of potassium nitrate (KNO_3) [nutrition]; thiourea (thiocarbamide CH_4N_2S) and yeast extract on the germination percentage; rate and periodicity of *Taxodium distichum* (L.) Rich. during 1999/2000 and 2000/2001 seasons:-

B-1-1. Germination percentage (%):-

Data concerning the effect of various soaking treatments on seed germination percentage are presented in Table (6) and Fig. (5) for the two seasons. It is clear that the germination percentage was affected with the different treatments, the highest percentage of germination was produced from soaking the seeds in yeast extract at 7000 p.p.m. as 55.00 and 65.40 % for the first and second seasons, respectively. On the other hand, the lowest percentage in the two seasons, resulted from the control with the means of 38.00 and 41.20 % for the first and second season, respectively. The highest germination percentage with the nutritional treatment of KNO_3 as 52.00 and 58.80 % resulted from soaking the seeds in KNO_3 at 1000 p.p.m. in the first and second seasons, respectively. While, soaking the seed in thiourea at 1000 p.p.m. gave the highast germination percentage as 48.00 and 57.00 % for the first and second season, respectively. The differences between all treatments and the contrd were signifiant in the second season. Yeast has been reported to be a rich source of phytohormones, vitamins, enyymes, amino acids, minerals, ...etc. it has been reported to participate a beneficiel role during stress due to is cytokinins content. These results are in agreement with those of **Roberts (1976)**. According to **ISTA (1976)** the

Table (6):- Effect of potassium nitrate (KNO_3) [nutrition]; thiourea (thiocarbamide CH_4N_2S) and yeast extract on the germination percentage; rate and periodicity of *Taxodium distichum* (L.) Rich. during 1999/2000 and 2000/2001 seasons.

Seasons		1999/2000			2000/2001		
Treatments (p.p.m.)		Germination percentage (%)	Germination rate	Germination periodicity (days)	Germination percentage (%)	Germination rate	Germination periodicity (days)
Control		38.00	2.46	8.79	41.20	1.90	10.34
KNO_3:	1000	52.00	5.76	13.71	58.80	5.69	15.91
	5000	49.00	2.84	7.28	57.00	2.74	9.63
	10000	42.00	2.47	7.72	50.80	2.36	10.03
Thiourea:	1000	48.00	5.27	13.87	57.00	5.34	15.61
	3000	41.00	3.80	12.26	50.20	3.93	14.03
	5000	40.00	3.82	12.73	50.20	3.85	13.83
Y.E.:	1000	45.00	2.79	7.97	53.40	2.65	10.36
	3000	46.00	2.85	7.92	53.80	2.65	10.30
	5000	47.00	5.72	15.46	55.80	5.56	16.39
	7000	55.00	4.17	9.27	65.40	4.20	11.83
L.S.D. at 5%		10.17	1.03	2.56	5.60	0.73	1.77

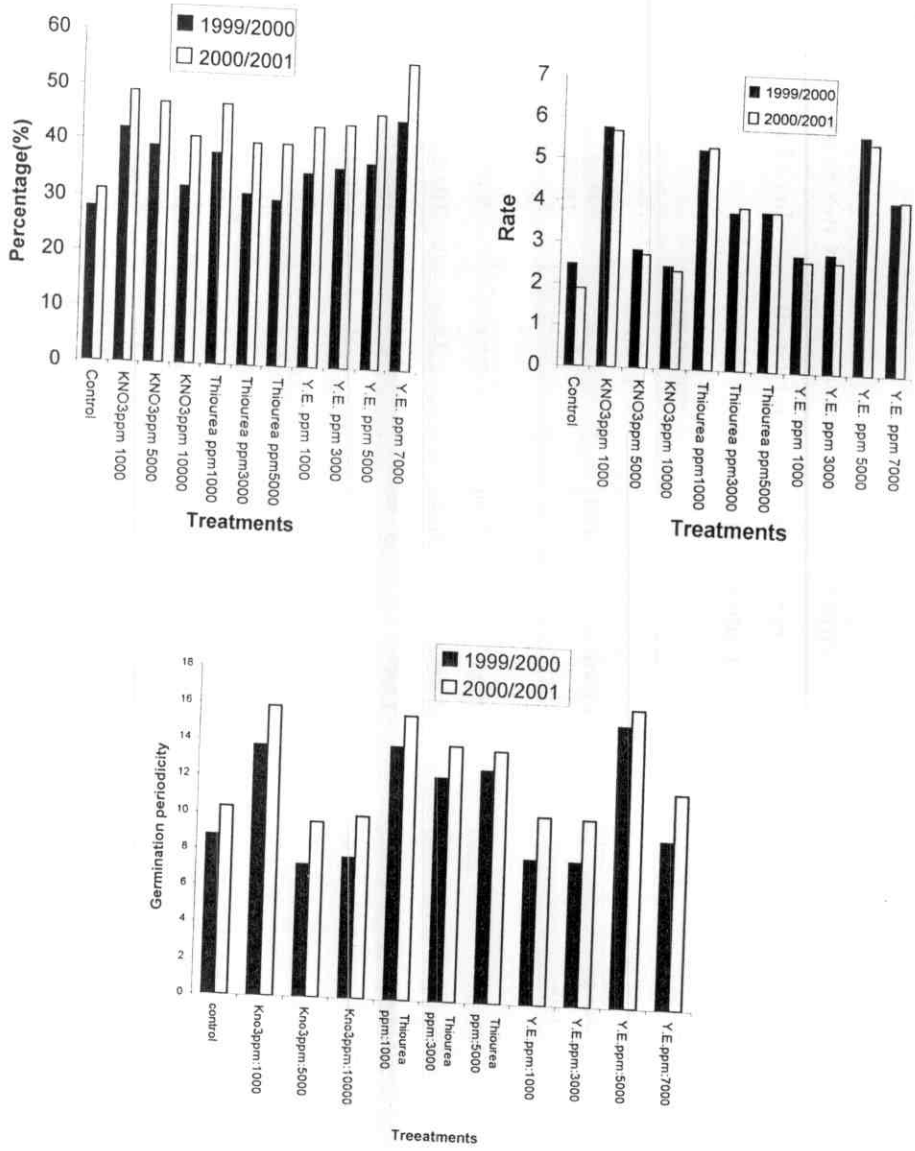


Figure (5): Effect of potassium nitrate (KNO_3) [nutrition], thiourea (thiocarbamide CH_4N_2S) and yeast extract on germination percentage, rate and periodicity of *Taxodium distichum* (L.) Rich. during 1999/2000 and 2000/2001 seasons.

Enhamcement of germination due to potassium nitrate (KNO_3) application may by attributed to an increase in cytochrome oxidase activity and thereby breacking the post harvest domancy. Also the finding of **Mukhopadhyay *et al.* (1990)** on *Peltophrum ferrugenium* seeds, who found that the best treatments which increased germination were potasium nitrate (KNO_3) at 1% for 24h. (40%) and thiourea at 0.1% for 6 or 12h. (26.66%).

B-1-2. Germination rate :-

It is clear from Table (6) and Fig.(5) that the highest rates of germination were obtained from soaking the seeds in KNO_3 at 1000 p.p.m. and yeast extract at 5000 p.p.m. in the two seasons, with the means of 5.76 and 5.72 for the first season and 5.69 and 5.56 for the second second season, resectively. However, the control treatment gave the lowest germination rate as 2.46 and 1.90 for the first and second seasons, respectively. Soaking the seeds in thiourea at 1000 p.p.m. gave the highest germination rate as 5.27 and 5.34 in the first and second seasons, respectively. The differences between the treatments which gave the highest germination rate and the lowest germination rate (the control) were significant in the two seasons.These results are in agreement with those of **Biswas *et al.* (1972)** on *Taxodium distichum* seeds who found that some concentrations of potassium nitrate (KNO_3) promoted germination. Also **Sharma and Sood (1990)** on *Leucaena leucocephala* var K8 found that soaking the seeds in potassium nitrate (KNO_3) treatment increased germination.

B-1-3. Germination periodicity (days):-

Table (6) and Fig. (5), show that, the fastest germination periodicity was obtained from soaking the seeds in potassium nitrate (KNO_3) at 5000 p.p.m. with the means of 7.28 and 9.63 days for the first and sacond seasons, respectively. On the contrary, the slowest germination periodicity resulted from soaking the seeds in yeast extract at 5000 p.p.m. with the means of 15.46 and 16.39 days for the first and second seasons, respectively. Soaking the seeds in thiourea at 3000 p.p.m. gave the fastest germination periodicity with the means of 12.26 and in the first season, and 5000 p.p.m. with the means of 13.83 days in the second season. The fastest germination periodicity of yeast extract treatments resulted from soaking the seeds in 3000 p.p.m. in the two seasons, with the means of 7.92 and 10.30 days for the first and second season, respectively. The differences in this respect were significant in the two seasons.

B-2. Effect of potassium nitrate (KNO_3) [nutrition] ; thiourea (Thiocabamide CH_4N_2S) and yeast extract on the growth of *Taxodium distichum* (L.) Rich. seedlings at age of 9 months after sowing during 1999/2000 and 2000/2001 seasons:-

B-2-1. Plant height (cm):-

Table (7) and Fig. (6) indicate that the plant height of ***Taxodium distichum*** was affected by the different treatments. In the two seasons, the tallest seedlings resulted from soaking the seeds in thiourea at 5000 p.p.m. with the means of 44.84 and 45.46 cm for the first and second seasons, respectively. On the other hand, the control gave the shortest seedlings with the

Table (7):- Effect of potassium nitrate (KNO_3) [nutrition]; thiourea (thiocarbamide CH_4N_2S) and yeast extract on the growth of *Taxodium distichum* (L.) Rich. seedlings at age of 9 months after sowing during 1999/2000 and 2000/2001 seasons.

Seasons		1999/2000				2000/2001			
Treatments (p.p.m.)		Plant height/ plant (cm)	Number of leaves/ plant	Thickness of stem/ plant (mm)	Root length/ plant (cm)	Plant height/ plant (cm)	Number of leaves/ plant	Thickness of stem/ plant (mm)	Root length/ plant (cm)
Control		32.03	22.84	4.77	73.28	31.75	22.37	4.63	71.97
KNO_3:	1000	35.71	26.27	4.94	68.89	35.93	26.74	4.96	69.20
	5000	35.27	28.02	5.52	75.94	36.37	29.09	5.57	77.32
	10000	36.12	31.43	5.44	74.37	37.57	32.26	5.01	74.93
Thiourea:	1000	35.05	25.91	5.43	75.24	35.54	26.25	5.32	76.07
	3000	34.15	27.37	5.54	84.86	35.72	28.27	5.65	86.72
	5000	44.84	41.83	6.50	104.06	45.46	43.58	6.70	106.51
Y.E.:	1000	37.37	33.47	5.58	105.70	37.92	35.29	5.70	110.77
	3000	37.42	28.02	5.55	101.09	38.25	28.78	5.67	102.86
	5000	37.49	28.97	5.49	82.53	38.10	28.42	5.53	82.96
	7000	35.06	23.59	5.38	84.31	36.52	25.36	5.24	82.93
L.S.D. at 5%		2.90	3.43	0.35	4.87	1.24	1.47	0.34	2.96

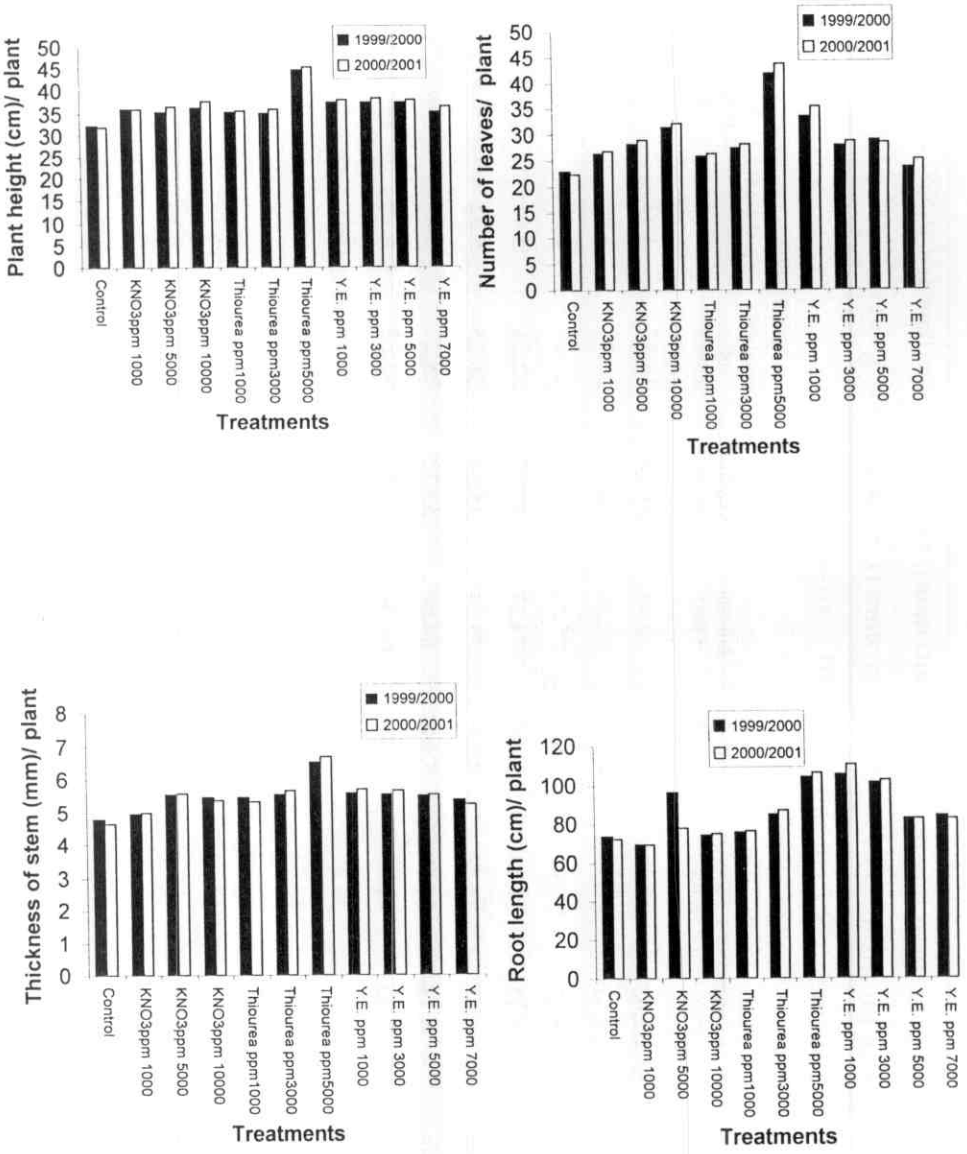


Figure (6): Effect of potassium nitrate (KNO_3) [nutrition]; thiourea (thiocarbamide CH_4N_2S) and yeast extract on the growth of *Taxodium distichum* (L.) Rich. seedlings at age of 9 months after sowing during 1999/2000 and 2000/2001 seasons.

means of 32.03 and 31.75 cm in the first and second seasons, respectively. The tallest plants with potassium nitrate (KNO_3) nutrition treatments were obtained from soaking the seeds in KNO_3 at 10000 p.p.m. with the means of 36.12 and 37.57 cm for the first and second season, respectively. While, the best plant height in yeast extract treatinents resulted from soaking the seeds in yeast extract at 5000 p.p.m. with the means of 37.49 cm for the first season and soaking the seeds in yeast extract at 3000 p.p.m. with the mean of 38.25 cm for the second season. The differences between the treatments which gave the tallest seedlings and the shortest seedlings (the control) were significant in the two seasons.

However, it may be mentioned that all treatments were effective on increasing plant height significantly over control as the differences among the treatments themselves were nonsignificant except for the treatment of soaking the seeds in thiourea at 5000 p.p.m. which gave signifcantly taller plant height when compared with the other treatments. The effect of thiourea may be attributed to cytokinin like activity **(Thomas, 1977).**

B-2-2.Number of leaves/plant:-

It is clear from Table (7) and Fig. (6) that the largest number of leaves resulted from soaking the seeds in thiourea at 5000 p.p.m. in the two seasons, with the means of 41.83 and 43.58 leaves/plant for the first and second seasons, respectively. On the contrary, in the two seasons, the minimum number of leaves was obtained from control with the means of 22.84 and 22.37 leaves/plant for the first and second seasons, respectively.

The best number of leaves in potassium nitrate (KNO_3) resulted from soaking the seeds in KNO_3 at 10000 p.p.m. in the two seasons, with the means of 31.43 and 32.26 leaves/plant for the first and second seasons, respectively. While, soaking the seeds in yeast exctract at 1000 p.p.m. in the two seasons, gave the best number of leaves with the means of 33.47 and 35.29 leaves/plant for the first and second seasons, respectively. The differences between the treatments which gave the largest numbers of leaves and the control were significant in the two seasons.

These results are in accordance with those of **Masilamani and Vadivelu (1997 a)** on *Hardwickia binata* Roxb. who found that the seeds treated with potassium nitrate (KNO_3) at 2 % gave seedling with high vigour. Also the findings of **Mahmoud (2001)** on *Magnolia grandiflora* L. seeds who found that yeast extract gave the higest growth rates regarding the different aspects.

B-2-3-. Thickness of stem (mm):-

Generally, the thickness of the stem took a similar trend as the plant height and the number of leaves. It is clear from Table (7) and Fig. (6) that, the thickest seedlings were produced from soaking the seeds in thiourea at 5000 p.p.m. in the two seasons, with the means of 6.50 and 6.70 mm for the first and second seasons, respectively. On the other hand, the thinnest seedling in the two seasons, resulted from the control with the means of 4.77 and 4.63 mm for the first and second seasons, respectively. The thickest stems from potassium nitrate (KNO_3) treatments resulted from soaking the seeds in KNO_3 at 5000 p.p.m. in the two seasons, with the means of 5.52 and 5.57 mm

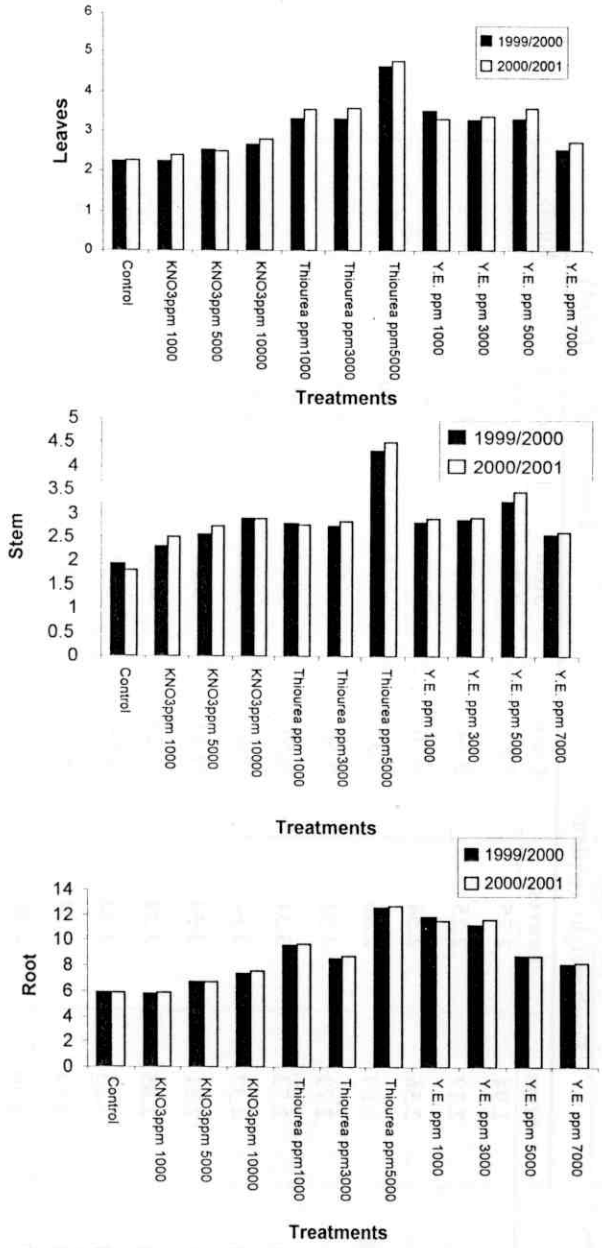


Figure (7): Effect of potassium nitrate (KNO_3) [nutrition]; thiourea (thiocarbamide CH_4N_2S) and yeast extract on the fresh weight (gm) of *Taxodium distichum* (L.) Rich. seedlings at age of 9 month after sowing during 1999/2000 and 2000/2001 seasons.

Table (8):- Effect of potassium nitrate (KNO_3) [nutrition]; thiourea (thiocarbamide CH_4N_2S) and yeast extract on the fresh weight (gm) of *Taxodium distichum* (L.) Rich. seedlings at age of 9 months after sowing during 1999/2000 and 2000/2001 seasons.

Seasons		1999/2000			2000/2001		
Treatments (p.p.m.)		Fresh weight (g/plant)			Fresh weight (g/plant)		
		Stem	Leaves	Roots	Stem	Leaves	Roots
Control		1.94	2.25	5.89	1.81	2.26	5.85
KNO_3:	1000	2.29	2.25	5.74	2.49	2.41	5.88
	5000	2.56	2.54	6.70	2.72	2.52	6.76
	10000	2.89	2.66	7.37	2.89	2.79	7.61
Thiourea:	1000	2.79	3.33	9.60	2.76	3.55	9.74
	3000	2.72	3.34	8.59	2.83	3.59	8.75
	5000	4.37	4.64	12.61	4.52	4.77	12.75
Y.E.:	1000	2.81	3.54	11.83	2.88	3.34	11.52
	3000	2.85	3.29	11.25	2.91	3.38	11.63
	5000	3.25	3.33	8.73	3.46	3.60	8.81
	7000	2.54	2.54	8.11	2.60	2.72	8.19
L.S.D. at 5%		0.40	0.50	0.47	0.16	0.19	0.24

effect on enlargement, protein and nucleic acid syhthesis. These results are in agreement with those of **Roberts (1976); Spencer *et al.* (1983)** and **Fathy and Farid (1996)**. Also **Dhankha and Santosh (1996)** found that soaking *Phllantthus emblica* seeds in 750 p.p.m. thiourea gave the most roots/seedling.

B-3. Effect of potassium nitrate (KNO_3) [nutrition] ; thiourea (thiocarbamide CH_4N_2S) and yeast extract on the fresh weight of *Taxodium distichum* (L.) Rich. seedlings at age of 9 months after sowing during 1999/2000 and 2000/2001 seasons:-

B-3-1. Fresh weight of the stem (gm):-

It is clear from Table (8) and Fig. (7) that, the heaviest fresh weight of the stem resulted from soaking the seeds in thiourea at 5000 p.p.m. in the two seasons, with the means of 4.37 and 4.52 gms for the first and second season, respectively. On the contrary, in the lightest fresh weight of the stem resulted from the control with the means of 1.94 and 1.81 gm for the first and second seasons, respectively. The best fresh weight was from soaking the seeds in at KNO_3 at 10000 p.p.m. in the two seasons, with the means of 2.89 and 2.89 gms for the first and second seasons, respectively. While, soaking the seeds in yeast extract at 5000 p.p.m. in the two seasons, gave the best fresh weight of the stems with the means of 3.25 and 3.46 gms in the first and second seasons, respectively. The differentes between all the treatments and the control were significant in the second season.

These results are in line with those of other researchers who obtained increased fresh weight of stems with seedling produced

for the first and second seasons, respectively. As for yeast extract treatments this was obtained from soaking the seeds in yeast extract at 1000 p.p.m. in the two seasons, with the means of 5.58 and 5.70 mm for the first and second seasons, respectively. The differences between the treatments which gave the thickest seedlings sand the control (the thinnest seedlings) were significant in the two seasons.

B-2-4. Root length (cm):-

It is clear from Table (7) and Fig. (6) that all yeast extract treatments gave the tallest roots in the two seasons, specially, soaking the seeds in yeast extract at 1000 p.p.m. with the means of 105.70 and 110.77 cm for the first and second season, respectively. On the other hand, in the two seasons, soaking the seeds in KNO_3 at 1000 p.p.m. gave the shortest roots with the means of 68.89 and 69.20 cm in the first and second season, respectively. The longest roots with thiourea treatments in the two seasons, resulted from soaking the seeds in thiourea at 5000 p.p.m. with the means of 104.06 and 106.51 cm for the first and second seasons, respectively. While, the best treatment of KNO_3 was 5000 p.p.m. in the two seasons, with the means of 95.94 and 77.32 cm for the first and second seasons, respectively. The differences among the treatments which gave the tallest roots and shortest roots were significant.

This effect of thiourea may be attributed to cytohinin like activity. While, the yeasts have been reported to be a rich source of phytohormones, vitamins, amino acids, minerals , ... etc. it has been reported to participate beneficial role during stress due to their cytokinins content and it was reported about its stimulatory

from treating seeds with thiourea; yeast extract and potasium nitrate (KNO_3). **Masilamani and Vadivelu (1997a)** on *Hardwickia binata* Roxb. found that souking the seeds in potasiun nitrate (KNO_3) at 2% gave seedling with high vigour.

B-3-2. Fresh weight of the leaves (gm):-

Generally, the fresh weight of the leaves took a similar trend as that in the fresh weight of stem. It is clear from Table (8) and Fig. (7) that the heaviest fresh weight of leaves resulted from soaking the seeds in thiourea at 5000 p.p.m. in the two seasons, with the means of 4.64 and 4.77 gms for the first and second season, respectively. On the other hand, contol gave the lightest fresh weight of leaves in the two seasons, with the means of 2.25 and 2.26 gms for the first and second seasons, reapectively. The best fresh weight of leaves in potassium nitrate (KNO_3) treatments resulted from soaking the seeds in KNO_3 at 10000 p.p.m. in the two seasons, with the means of 2.66 and 2.79 gms for the first and second seasons, respectively. While, the best fresh weight of leaves in yeast extract treatments was from soaking the seeds in yeast extract at 1000 p.p.m. with the mean of 3.54 gms for the first season and soaking the seeds in yeast extract at 5000 p.p.m. with the mean of 3.60 gms for the second season. The differences between all treatments and the control were significant in the second season.

Generally, the control seeds (soaking the seeds in water for 24h.) gave the lightest fresh eight of the leaves with significant reductions than the treatments which gave the heaviest fresh weight of leaves, as these results agreed with those of **Murugesh *et al.* (1998)** on *Emblica officinals (Phyllanthus embica* Amla.)

who found that seed treatments which enhanced germination and seedling vigour were 1% KNO_3 and soaking in water.

B-3-3. Fresh weight of the roots (gm):-

From Table (8) and Fig.(7), it is clear that fresh weight of the roots was affected with the different treatments. The heaviest fresh weight of roots was produced from soaking the seeds in thiourea at 5000 p.p.m. in the two seasons, with the means of 12.61 and 12.75 gms for the first and second seasons, respectively. On the contrary, in the two seasons, the lightest fresh weight of roots resulted from the control and soaking the seeds in KNO_3 at 1000 p.p.m. with the means of 5.89 and 5.74 gms for the first season, respectively and with the means of 5.85 and 5.88 gms for the second season, respectively. All yeast extract treatments gave heavier fresh weight of roots in the two seasons, specially, soaking the seeds in yeast extract at 1000 p.p.m. with mean of 11.83 gms for the first season and in yeast extract at 3000 p.p.m. with the mean of 11.63 gms for the second season. While, the best fresh weight of the roots from potassium nitrate (KNO_3) treatments was obtained from soaking the seeds in KNO_3 at 10000 p.p.m. in the two seasons, with the means of 7.37 and 7.61gms for the first and second season, respectively. The differences between all the treatments and the lightest fresh weight of the roots were significant in the two seasons.

B-4. Effect of potassium nitrate (KNO_3) [nutrition] ; thiourea (thiocarbamide CH_4N_2S) and yeast extract on the dry weight of *Taxodium distichum* (L.) Rich. seedlings at age of 9 months after sowing during 1999/2000 and 2000/2001 seasons:-

B-4-1. Dry weight of the stem (gm):-

It is clear from Table (9) and Fig. (8) that the heaviest dry weight of the stems resulted from soaking the seeds in the thiourea at 5000 p.p.m. in the two seasons, with the means of 2.79 and 2.88 gms for the first and second seasons, respectively. On the other hand, in the two seasons, the control gave the lightest dry weight of stems with the means of 1.14 and 1.09 gm for the first and second seasons, respectively. The best dry weight of the stem with potassium nitrate (KNO_3) treatments was obtained from soaking the seeds in KNO_3 at 5000 p.p.m. in the two seasons, with the means of 1.33 and 1.44 gm for the first and second season, respectively. While, soaking the seeds in yeast extract at 5000 p.p.m. gave the best dry weight of the stem in the two seasons, with the means of 1.68 and 1.81 gm for the first and second seasons, respectively. The differences between all treatments and the control were significant in the second season. These results agreed with those of **Murugesh *et al.* (1998)** on *Emblica officinals (Phyllanthus emblica* Amla.) who found that seed treatments which have enhanced germination and seedling vigour of sinkers were 1% KNO_3 and soaking in water.

Table (9):- Effect of potassium nitrate (KNO_3) [nutrition]; thiourea (thiocabamide CH_4N_2S) and yeast extract on the dry weight (gm) of *Taxodium distichum* (L.) Rich. seedlings at age of 9 months after sowing during 1999/2000 and 2000/2001 seasons.

Seasons		1999/2000			2000/2001		
Treatments (p.p.m.)		Dry weight (g/plant)			Dry weight (g/plant)		
		Stem	Leaves	Roots	Stem	Leaves	Roots
Control		1.14	1.24	2.62	1.09	1.20	2.54
KNO_3:	1000	1.29	1.27	2.79	1.38	1.29	2.85
	5000	1.33	1.28	3.25	1.44	1.32	3.42
	10000	1.31	1.29	3.77	1.40	1.36	3.79
Thiourea:	1000	1.53	1.65	4.26	1.65	1.59	4.23
	3000	1.64	1.67	3.80	1.72	1.79	3.88
	5000	2.79	2.47	7.25	2.88	2.56	7.54
Y.E.:	1000	1.65	1.77	5.40	1.70	1.66	5.24
	3000	1.67	1.68	5.15	1.79	1.81	5.29
	5000	1.68	1.71	3.94	1.81	1.73	4.03
	7000	1.31	1.35	3.70	1.35	1.45	3.80
L.S.D. at 5%		0.26	0.21	0.35	0.11	0.08	0.53

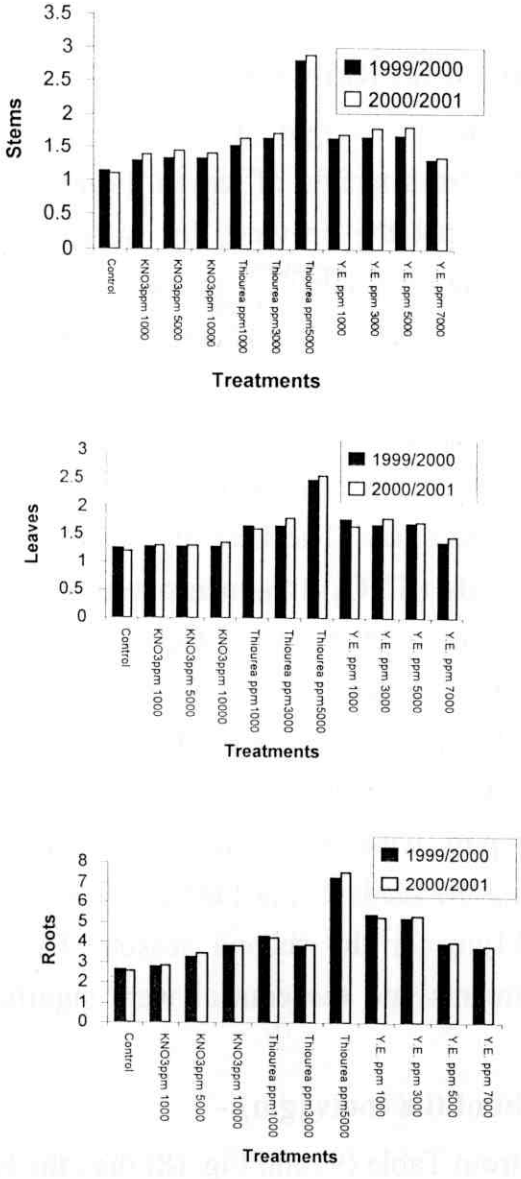


Figure (8):Effect of potassium nitrate (KNO_3) [nutrition]; thiourea (thiocarbamide CH_4N_2S) and yeast extract on the dry weight (gm) of *Taxodium distichum* (L.) Rech. seedlings at age of 9 months after sowing during 1999/2000 and 2000/2001 seasons.

B-4-2. Dry Weight of the leaves (gm):-

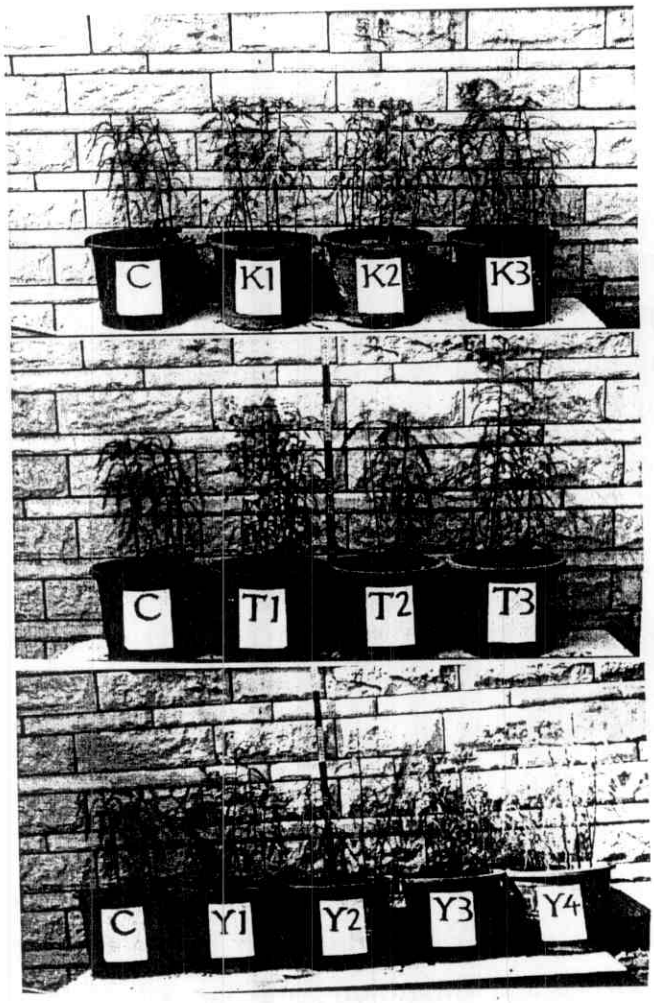
Generally, the dry weight of the leaves took a similar trend as that in the fresh weight of leaves. From Table (9) and Fig. (8) it is clear that the heaviest dry weight of the leaves resulted from soaking the seeds in thiourea at 5000 p.p.m. in the two seasons, with the means of 2.47 and 2.56 gms for the first and second seasons, respectively. On the contrary, the lightest dry weight of leaves was obtained from the control seeds in the two seasons, with the means of 1.24 and 1.20 gm for the first and second season, respectively. The best dry weight of the leaves with potassium nitrate (KNO_3) treatments resulted from soaking the seeds in KNO_3 at 10000 p.p.m. in the two seasons, with the means of 1.29 and 1.36 gm for the first and second season, respectively. While, the best dry weight of the leaves in yeast extract treatments was produced from soaking the seeds in yeast extract at 1000 p.p.m. with the means of 1.77 gm for the first season and soaking the seeds in yeast extract at 3000 p.p.m. with the mean of 1.81gm for the second season. The differences between all treatments and the control were significant in the second season.

B-4-3. Dry weight of the roots (gm):-

It is clear from Table (9) and Fig. (8) that, the heaviest dry weight of roots was produced from soaking the seeds in thiourea at 5000 p.p.m. in the two seasons, with the means of 7.25 and 7.54 gms for the first and second season, respectively. On the other hand, in the two seasons, the control gave the lightest dry weight of the roots with the means of 2.62 and 2.54 gms for the first and second seasons, respectively. The best dry weight of the

roots from potassium nitrate (KNO_3) treatments resulted from soaking the seeds in KNO_3 at 10000 p.p.m. with the means of 3.77 and 3.79 gms for the first and second season, respectively. All yeast extract treatments gave high dry weight of the roots in the two seasons, specially, soaking the seeds in yeast extract at 1000 p.p.m. with the mean of 5.40 gms for the first season and soaking the seeds in yeast extract at 3000 p.p.m. with the mean of 5.29 gms for the second season. The differences among the treatments which gave the heaviest dry weight of the roots and control were significant in the two seasons.

From all data presented in Tables 7, 8 and 9 it can he concluded that thiourea solution at 5000 p.p.m. was a main factor for stimultion of vegetative growth of ***Taxodium distichum*** seedlings at age of 9 month after sowing. The previous results hold true with those reported by **Mukhopadhyay *et al.* (1990)** on *Peltophrum ferrugenium* seeds; **Farrukh and Ihsan (1991)** on *Prosopis glandulosa*; **Row (1992)** on *Albizzia lebbek*, **Jhon and Paul (1994)** on *Cupressus sempervirens* and **Dhankhar and Santash (1996)** who found that soaking *Phyllanthus emblica* Linn. seeds in 750 p.p.m. thiourea solution gave the most roots/seedling. Also the findings of **Mahmoud (2001)** on *Magnolia grandiflora* L. seeds who found that yeast extract application increased the highest growth rates regading different aspects; increased carbohydrates and sugars biosynthesis and translocation; improved dry matter accumulation in different plant argans and increased minerals absorption by roots and its translocation to other organs.



Photog.(6):- Effect of potassium nitrate (KNO_3) [nutrition]; thiourea (thiocarbamide CH_4N_2S) and yeast extract on the growth of *Taxodium distichum* (L.) Rich. seedlings at age of 9 months after sowing during 1999/2000 and 2000/2001 seasons.

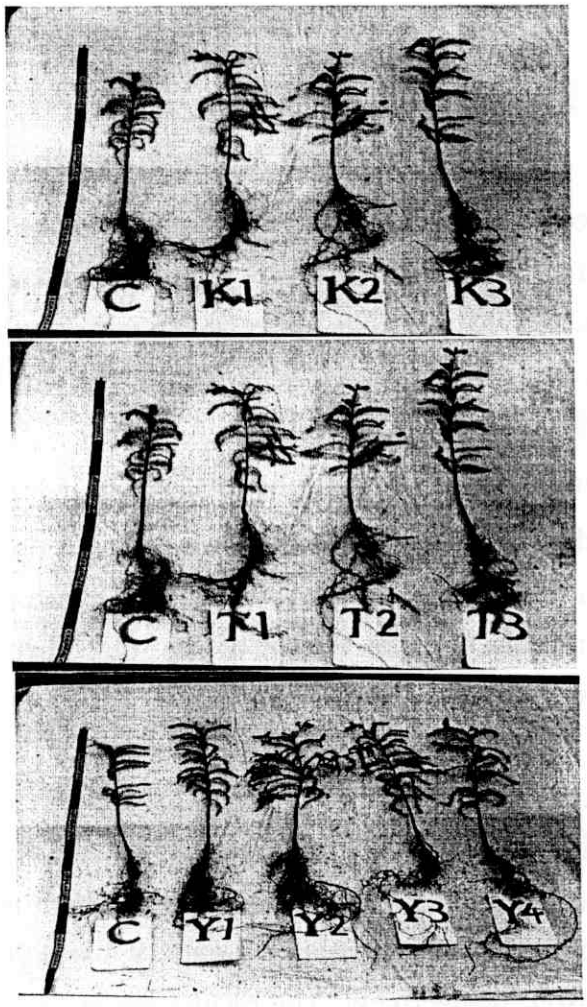
C: Control.

K1: KNO_3 at 1000p.p.m. ***K2:*** KNO_3 at 5000p.p.m. ***K3:*** KNO_3 at 10000p.p.m.

T1: Thiourea at 1000p.p.m. ***T2:*** Thiourea at 3000p.p.m. ***T3:*** Thiourea at 5000p.p.m.

Y1: Yeast extract at 1000p.p.m. ***Y2:*** Yeast extract at 3000 p.p.m.

Y3: Yeast extract at 5000p.p.m. ***Y4:*** Yeast extract at 7000 p.p.m.



Photog.(7): Effect of potassium nitrate (KNO_3) [nutrition]; thiourea (thiocarbamide CH_4N_2S) and yeast extract on the growth of *Taxodium distichum* (L.) Rich. seedlings at age of 9 months after sowing during 1999/2000 and 2000/2001 seasons.

***C*:** Control.

K1: KNO_3 at 1000 p.p.m. ***K2*:** KNO_3 at 5000 p.p.m. ***K3*:** KNO_3 at 10000 p.p.m.

T1: Thiourea at 1000 p.p.m. ***T2:*** Thiourea at 3000 p.p.m. ***T3*:** Thiourea at 5000 p.p.m.

Y1: Yeast extract at 1000 p.p.m. ***Y2:*** Yeast extract at 3000 p.p.m.

Y3: Yeast extract at 5000 p.p.m. ***Y4:*** Yeast extract at 7000 p.p.m.

B-The second part:

A- *Albizzia lebbeck* Benth.

A-1. Effect of date of seed collection on the seed chemical content of total phenols (p.p.m.); total amino acids (p.p.m.); total carbohydrates (p.p.m.) and total indoles (p.p.m.) of *Albizzia lebbeck* Benth. during 1999/2000 and 2000/2001 seasons:-

A-1-1. Seed content of total phenols (p.p.m.):-

Table (10) and Fig. (9) show the seeds content of total phenols as affected by the seeds collection in the different dates. In two seasons, the highest content of the total phenols was obtained from the seeds of *Albizzia lebbeck* collected in the third date (15th Jan.) with the means of 29.4 and 23.1 p.p.m. for the first and second seasons, respectively. On the contrary, in the two seasons, the seeds collected in the first date (15th Nov.) and the fifth date (15th Mar.) gave the lowest content of the total phenols with the means of 20.1 and 19.7 p.p.m. for the first season and 19.4 and 20.9 p.p.m. for the second season, respectively. The results are in line with the findings of **Krawiarz (1973)** who found that among the pericarp inhibitors phenols as salycilic, oxibenzoic, cinnamic and some other acids exist. Different simple phenyl componds, however, were the most widely represented inhibitors including benzoic acid, the longer chained cinnamic acid series, and the lactones of these the coumarin series **(Bentley, 1958 and Lane and Bailey, 1964).**

A-1-2. Seed content of total amino acids (p.p.m.):-

It is clear from Table (10) and Fig. (9) that the highest total amino acids content in the two seasons, resulted from the

Table (10): Effect of date of seed collection on the seeds chemical content of total phenols (p.p.m.); total amino acids (p.p.m.); total carbohydrates (p.p.m.) and total indoles (p.p.m.) of *Albizzia lebbeck* Benth. during 1999/2000 and 2000/2001 seasons.

Date of collection	1999/2000				2000/2001			
	Total phenols	Total amino acids	Total carbohydrates	Total indoles	Total phenols	Total amino acids	Total carbohydrates	Total indoles
D (I) 15th Nov.	20.1	55.1	154.0	28.6	19.4	59.3	155.2	27.3
D (II) 15th Dec.	28.8	88.4	174.7	18.3	21.4	93.7	176.1	17.1
D (III) 15th Jan.	29.4	73.7	117.2	13.4	23.1	81.1	116.6	12.6
D (IV) 15th Feb.	21.1	62.3	131.6	14.1	22.0	64.1	130.6	13.6
D (V) 15th Mar.	19.7	68.1	140.6	4.1	20.9	69.7	138.3	5.8

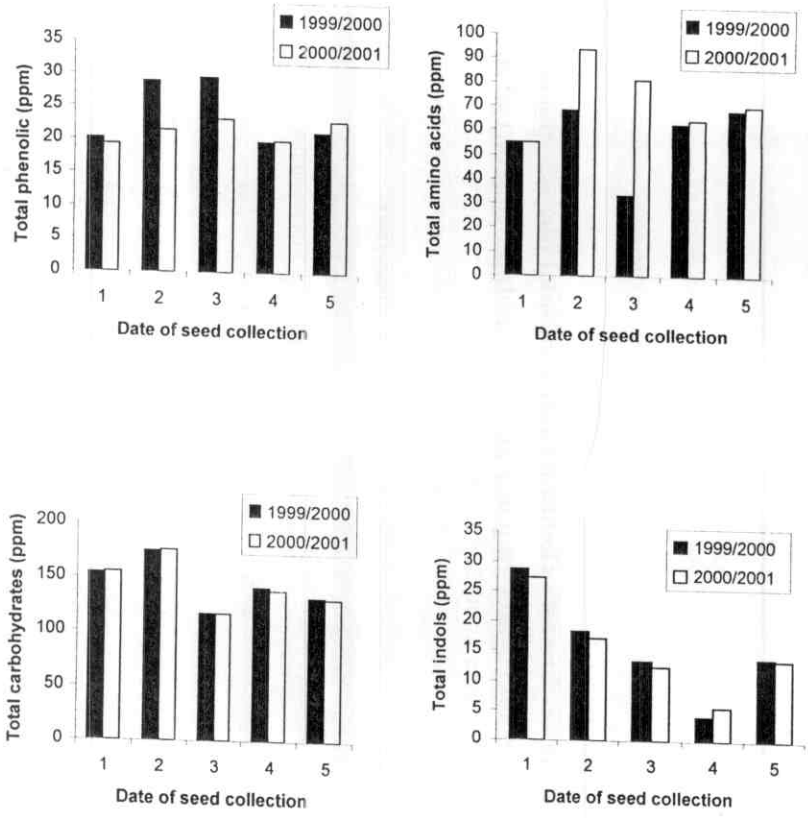


Figure (9): Effect of the date of seed collection on the seeds chemical content of total phenols (ppm); total amino acids (ppm); total carbohydrates (ppm) and total indoles (ppm.) of *Albizzia lebbeck* Benth. during 1999/2000 and 2000/2001 seasons.

P.N.:-(1) The first date (15th Nov.).
(2) The second date (15th Dec.).
(3) The third date (15th Jan.).
(4) The fourth date (15th Feb.).
(5) The fifth date (15th Mar.).

seeds collected in the second date (15th Dec.) with the means of 88.4 and 93.7 p.p.m. for the first and second seasons, respectively. On the other hand, in the tow seasons, the lowest total amino acids content was produced from the seeds collected in the first date (15th Nov.) with mean of 55.1 and 59.3 p.p.m. for the first and second seasons, respectively.

A-1-3. Seed content of total carbohydrates (p.p.m.):-

From Table (10) and Fig. (9) it is clear that the highest total of carbohydrates content in the two seasons resulted from the seeds collected in the second date (15th Dec.) with the means of 174.7 and 176.1 p.p.m. for the first and second season, respectively. On the other hand, in the two seasons, the seeds collected in the third date (15th Jan.) gave the lowest total content of carbohydrates with the means of 117.2 and 116.6 p.p.m. for the first and second seasons, respectively.

A-1-4. Seed content of total indoles (p.p.m.):-

Data in Table (10) and Fig. (9) show the effect of the different dates of the seeds collection on seed content of total indoles. In the two season, the seeds collected in the first date (15th Nov.) gave the highest total indoles content with the means of 28.6 and 27.3 p.p.m. for the first and second seasons, respectively. On the contrary, the lowest total indoles content was produced from the seeds collected in the fifth date (15th Mar.) with means of 4.1 and 5.8 p.p.m. for the first and second season, respectively.

These results are in harmony with those obtained by **VanSumere (1960)** who found that phenolic compounds in plants and fruits, might act, as a natural germination inhibitors.

The suggested mechanism of action for these growth inhibitors are the competition between trans-cinnamic acid and IAA at a particular site and the formation of loose combinations or easily dissociated coumarin compounds of enzymes or plant cell metabolizes. Furthermore **Thimann and Bonner (1949)** suggested that these compounds react with sulfhydryl group (SH) of enzymes by the unsaturated lactones, coumarin and protoanemonin and the mechanism of action of these inhibitors was at the molecular level.

A-2. Effect date of seed collection on the weight of 100 seeds (gm), seeds moisture content (%); germination percentage (%); rate and periodicity (days) of *Albizzia lebbeck* Benth. during 1999/2000 and 2000/2001 seasons:-

A-2-1. Weight of 100 seeds (gm):-

It is clear from Table (11) and Fig. (10) that the weight 100 seeds was affected with the different dates of seed collection in the two seasons. The heaviest weight of 100 seeds resulted from the seeds collected in first date (15th Nov.) in the two seasons, with the means 22.43 and 22.73 gm for the first and second seasons, respectively. On the other hand, the seeds collected in fifth data (15th Mar.) gave the lightest weight of 100 seeds with the means of 7.58 and 9.64 gm for the first and second seasons, respectively. There were significant differences among the different data of seed collection on the weight of 100 seeds in the two seasons.

The fact that the seed collection in first data (15th Nov.) were heavier may be due to more moisture content. Another reason may be that the seeds collected in first date (15th Nov.)

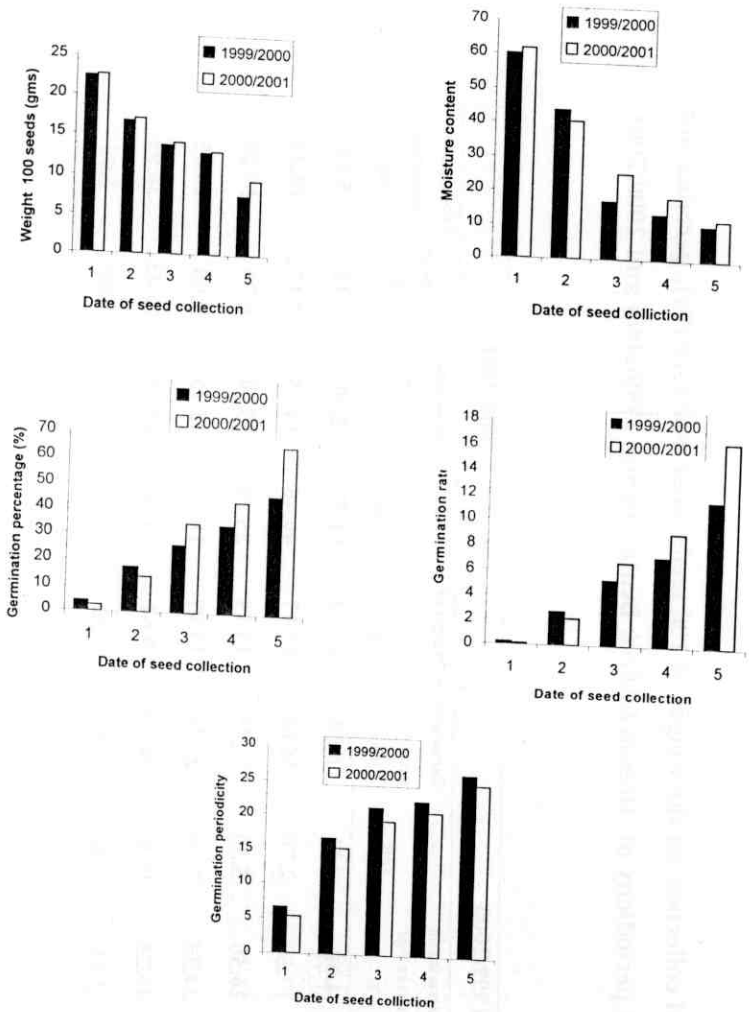


Figure (10): Effect of the date of seed collection on the weight of 100 seeds, seeds moisture (%), germination percentage, rate and periodicity of *Albizzia lebbeck* Benth. during 1999/2000 and 2000/2001 seasons.

P.N.:-(1) The first date (15th Nov.).
(2) The second date (15th Dec.).
(3) The third date (15th Jan.).
(4) The fourth date (15th Feb.).
(5) The fifth date (15th Mar.).

Table (11):-Effect of date of seed collection on the weight of 100 seeds; seed moisture (%); germination percentage; rate and periodicity of *Albizzia lebbeck* Benth. during 1999/2000 and 2000/2001 seasons.

Seasons	1999/2000					2000/2001				
Date of seed collection	Weight of 100 seeds (gm)	seeds Moistue (%)	Germinatin percentage (%)	Germinatin rate	Germinatin periodicity (days)	Weight of 100 seeds (gm)	seeds Moisture (%)	Germinatn percentage (%)	Germinatin rate	Germination periodicity (days)
D(I) 15th Nov.	22.43	60.05	4.00	0.21	6.50	22.73	61.97	2.50	0.13	5.20
D(II) 15th Dec.	16.82	43.88	17.50	2.70	16.68	17.17	40.46	14.25	2.17	15.22
D(III) 15th Jan.	13.77	17.03	26.50	5.30	21.25	14.19	25.20	35.00	6.74	19.26
D(IV) 15th Feb.	12.91	13.36	34.25	7.19	22.34	13.07	18.50	43.75	9.08	20.75
D(V) 15th Mar.	7.58	10.24	46.25	11.63	26.40	9.64	11.80	65.75	16.43	24.99
L.S.D. at 5%	1.10	2.31	3.51	1.50	2.51	0.93	3.94	2.94	2.08	2.05

have not been ripen completely yet, these results agree with those of **Daniel *et al.* (1988)** on *Astronium concinnum* Schott. who found that greatest percentage of germination and germination speed were found with seeds collected 35 to 50 days after the beginning of seed dispersal. The dry weight of these seeds were 5,95-6,34 g and moisture content was 28-30%. When moisture content was > 60% seeds were non–viable. Thus, it could be concluded that the incease in moisture content in seed could decrease the seeds viablility. Also the finding of **Masilamani and Vadivelu (1997 c)** on *Cassia siamea* who found that pod and seed weight increased over time and reached a maximum at 133 days after anthesis (DAA). Also **Masilamani and Vadivelu (1997 a)** on *Prosopis juliflora* found that pod and seed weight increased with age and reached a maximum at 91 days after anthesis (DAA). On this ground, the behavior of seed maturity takes different steps before viablity.

A-2-2. Seeds moisture content (%):-

Data in Table (11) and Fig. (10) show, that the highest moisture (%) in the two seasons, resultad from the seeds collected in the first date (15th Nov.) with the means of 60.05 and 61.97% for the first and second season, respectively. On the other hand, in the two seasons, the lowest moisture (%) was in the seeds collected in the fifth date (15th Mar.) with the means of 10.24 and 11.80 % for the first and second seasons, respectively. There were significant differences among the effect of different dates of the seeds collection on the moisture (%) in the two seasons .

These results agree with those of **Daniel *et al.* (1988)** on ***Astronium concinnum* Schott.** who found that when moisture content was > 60 % seeds were non–viable. Also the finding of **Sangakkara (1993)** on ***Myristica fragrans* Houtt.** who gave relation between the seed moisture contents and germination characteristics and mentioned that final germination percentages were 65, 75 and 90 % for fully mature, fully ripe and freshly fallen seeds, respectively, and seed moisture contents were 66.16, 60.11 and 58.27% DW, respectively.

A-2-3. Germination percentage (%):-

It is clear from Table (11) and Fig. (10) that the germination percentage was affected with the different dates of the seed collection in the two seasons. The highest percentage of germination was obtained from the seeds collected in the fifth date (15th Mar.) in the two seasons, with the means of 46.25 and 65.75% for the first and second seasons, respectively. On the contrary, the seeds collected in the first date (15th Nov.) gave the lowest percentage in the two seasons with the means of 4.00 and 2.50% for the first and second seasons, respectively. There were significant differences among the effect of the different dates of the seed collection on the seed germination percentage in the two seasons.

The fact that the seed collection in fifth date (15th Mar.) gave the highest percentage may be due to disappearance of some growth inhibitors and also may be due to a high rate of sugars accumulation in embryo cells. These results are in agreement with those of **Barton (1965)** and **Pillay (1966)** who pointed out that dormancy and germination are the many plant

growth responses that are probably controlled by the balance of growth inhibitors and promoters. This balance seems to be shifted in favour of the inhibitory-substances during seed maturation, resulting in resting conditions. Also the finding of **Krawiarz (1973)** showed that among the pericarp inhibitors phenols as salycilic, oxibenzoic, cinnamic and some other acids exist. Different simple phenyl componds, however, were the most widely represented inhibitors including benzoic acid, the longer chained cinnamic acid series, and the lactones of these the coumarin series **(Bentley, 1958 and Lane and Bailey, 1964) McCreary and Koukoura (1990)** on blue oak *Quercus douglasii* found that acorns from all harvest dates had high germination (average >90%). Also the findings of **Sangakkara (1993)** on nutmeg *Myristica fragrans* Houtt., revealed that germination percentage were 65, 75 and 90 % for fully mature, fully ripe and freshly fallen seeds, respectively. **Sharma *et al.* (1996)** on *Acacia catechu* Willd., found that seeds collected on December 10 from trees gave the highest percentage germination of 62.27%.

A-2-4. Germination rate:-

Data in Table (11) and Fig. (10) show the effect of the different dates of seeds collection on the seed germination rate for the two seasons. The highest germination rate in the two seasons, resulted from the seeds collected in the fifth date (15^{th} Mar.) with the means of 11.63 and 16.43 for the first and second seasons, respectively. On the other hand, in the two seasons, the lowest germination rate was obtained from the seeds collected in the first date (15^{th} Nov.) with the means of 0.21 and 0.13 for the

first and second seasons, respectively. There were significant differences among the effects of different dates of seed collection on the seed germination rate in the two seasons.

The reason may be due to the phenols level in seeds which compete with growth hormones and prevent the action of either enzymes or plant cell metabolites. The results are in line with the findings of **Barton (1965) and Pillay (1966)** who pointed out that dormancy and germination are the many plant growth responses that are probably controlled by the balance of growth inhibitors and promoters. This balance seems to be shifted in favour of the inhibitory-substances during seed maturation, resulting in resting conditions. **Marbach and Mayer (1975)** found that the seed coats of *Pisum elatius* of the normally impereable species contain a rather high level of phenolic compounds and also of catechol oxidase. The action of catechol oxidase of these phenolic compounds is oxygen dependent. In the absence of oxygen the phenolics are not oxidised to corresponding quinones, and therefore, there is no (tanning) reaction of seed coat proteins. On the basis of these findings it has been suggested that the impermeability to water is the results of a tanning reaction of proteins which is caused by the action of catechol oxidase on endogenous phenols.

A-2-5. Germination periodicity (days):-

It is clear from Table (11) and Fig. (10) that the germination periodicity was affected with the different dates of the seed collection, in the two seasons. The highest germination periodicity in the two seasons, resulted from the seeds collected in the fifth date (15^{th} Mar.) with the means of 26.40 and 24.99

days for the first and second seasons, respectively. On the other hand, in the two seasons, the lowest germination periodicity resulted from the seeds collected in the first date (15th Nov.) with the means of 6.50 and 5.20 days for the first and second seasons, respectively.The differences of the highest and lowest germination periodicity were significant in the two seasons. The results are in line with the finding of **Jussey and Monin (1981)** who found that the seed coat inhibition in the dorment seed strains of petunia which is due, presumably to chemicals moved from the coat to the endosperm and embryo. In the juvenile stage seeds lack such inhibitors.

A-3. Effect of date of seed collection on the growth of *Albizzia lebbeck* Benth. seedlings at age of 9 months after sowing during 1999/2000 and 2000/2001 seasons:-

A-3-1. Plant height (cm) :-

The plant height was affected with the different dates of seed collection (Table 12 and Fig. 11). In the two seasons, the plants grown from seeds collected in the second date (15th Dec.) gave the tallest seedlings with the means of 38.11 and 35.15 cm for the first and second season, respectively. On the other hand, the shortest seedlings resulted from the seeds collected in the fourth date (15th Feb.) in the two seasons, with the means of 23.98 and 22.31cm for the first and second season, respectively. The differences in this concern were significant in the two seasons. The results are in line with the findings of **Negi and Todaria (1995)** on seeds of 5 forest trees species e.g. *Acer oblongum, Kydia calyciana, Terminalia chebula, T. tomentosa* and *T. belerica* who found that *T. Chebula* seedlings from the

Table (12):- Effect of date of seed collection on the growth of *Albizzia lebbeck* Benth. seedlings at age of 9 months after sowing during 1999/2000 and 2000/2001 seasons.

Seasons	1999/2000					2000/2001				
Date of seed collection	Plant height (cm)	Number of leaves/ plant	Thickness of stem/plant (mm)	Root length/ plant (cm)	Number of nodules/ plant	Plant height (cm)	Numbe of leaves/ plant	Thickness of stem/ plant (mm)	Root length/ plant (cm)	Number of nodules/ plant
D(I) 15th Nov.	33.81	34.24	5.86	64.78	2.42	34.90	36.83	6.07	68.35	2.67
D(II) 15th Dec.	38.11	32.16	5.37	54.82	3.67	35.15	50.42	6.51	75.29	3.77
D(III) 15th Jan.	35.16	38.79	5.30	60.05	1.37	32.24	34.73	4.70	47.89	1.52
D(IV) 15th Feb.	23.98	28.47	3.77	47.17	0.98	22.31	22.08	4.04	45.56	0.98
D(V) 15th Mar.	25.89	20.53	4.04	48.00	1.56	24.20	15.81	3.87	38.52	1.63
L.S.D. at 5%	3.42	3.51	0.44	5.03	0.29	2.92	5.31	0.40	6.04	0.68

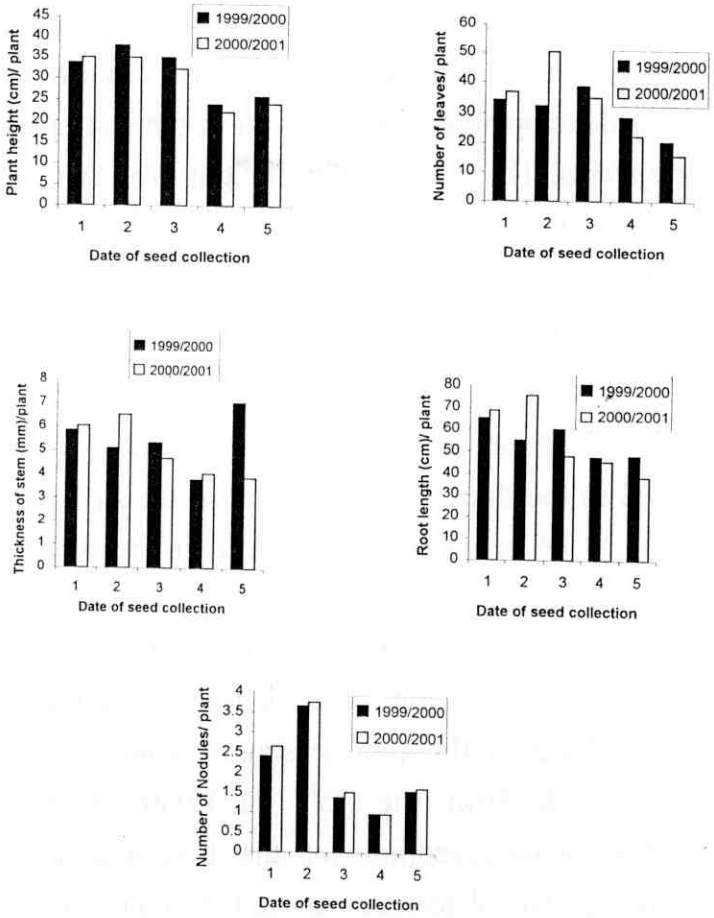


Figure (11): Effect of date of the seed collection on the growth of *Albizzia lebbeck* Benth. seedlings at age of 9 months after sowing during 1999/2000 and 2000/2001 seasons.

P.N.:-(1) The first date (15th Nov.).
(2) The second date (15th Dec.).
(3) The third date (15th Jan.).
(4) The fourth date (15th Feb.).
(5) The fifth date (15th Mar.).

first seed collection died after transfer to polythene bags, possibly due to low vigour; maximum seedling development was recorded after 6 months in the third collection. Maximum seedling development was observed in the last collection for all other species. The best seedling height growth was recorded in *A. oblongum* (19.7 cm after 6 months), while collar diameter growth was best in *T. Tomentosa* (17.2 cm after 6 months).

A-3-2. Number of leaves/plant:-

From Table (12) and Fig. (11), it is clear that, the highest number of leaves on the seedling resulted from the seeds collected in the third date (15th Jan.) in the first season with the mean of 38.79 leaves/seedling. While, in the second season, the seeds collected in the second date (15th Dec.) gave the highest number of leaves on seedling with mean of 50.42 leaves/seedling. On the other hand, the lowest number of leaves/seedling in the two seasons, resulted from the seeds collected in the fifth date (15th Mar.) with the means of 20.53 and 15.81 leaves/seedling for the first and second seasons, respectively. The difference among the highest number of leaves and the lowest number of leaves on seedling were significant in the two seasons.

A-3-3. Thickness of stem (mm):-

From Table (12) and Fig. (11) it is clear that the thickest seedling resulted from the seeds collected in the first date (15th Nov.) in the first season with the mean of 5.86 mm. While, in the second season, the seeds collected in the second date (15th Dec.) gave the thickest seedlings with the mean of 6.51mm. On the contrary, the seeds collected in the fourth date (15th Feb.) in the

first seasons gave the thinnest seedling with the mean of 3.77 mm. While, in the second seasons, the thinnest seedlings resutled from the seeds collected in the fifth date (15th Mar.) with the mean of 3.87 mm . The differences between the different dates of seed collection which their seeds gave the thickest and thinnest seedlings were significant in the two seasons.

A-3-4. Root length (cm):-

It is clear from Table (12) and Fig. (11) that the tallest roots were obtained from the seeds collected in the first date (15th Nov.) in the first season with the mean of 64.78 cm. While, in the second season, the seeds collected in the second date (15th Dec.) gave the tallest roots with mean of 75.29 cm. On the other hand, the shortest roots resulted from the seeds collected in the fourth date (15th Feb.) and the fifth date (15th Mar.) with the means of 47.17 and 48.00 cm for the first season, respectively. While, in the second season, the seeds collected in the fifth date (15th Mar.) gave the shortest roots with the mean of 38.52 cm. The differences among the different dates of the seeds collection which gave the tallest and the shortest roots were significant in the two seasons. These results are in harmony with those obtained by **Sharma *et al.* (1996)** on *Acacia catechu*, who found that, the seeds collected on December 10 from trees gave the greatest root (32.00 cm) length.

A-3-5. Number of nodules on the roots:-

It is clear from Table (12) and Fig.(11) that, number of nodules on the roots of seedlings was affected with the different dates of the seeds collection. In the two seasons, the highest number of nodules on the roots of seedling was obtained from

the seeds collected in the second date (15th Dec.) with the means of 3.67 and 3.77 nodules/seedling for the first and second seasons, respectively. On the other hand, in the two seasons, the seeds collected in the fourth date (15th Feb.) gave the lowest number of nodules on the roots of seedlings with the mean of 0.98 for each season. The differences among the effect of the different dates of the seeds collection were significant in the two seasons.

A-4. Effect of date of seed collection on the fresh weight (gm) of *Albizzia lebbeck* Benth. seedlings at age of 9 months after sowing during 1999/2000 and 2000/2001 seasons:-

A-4-1. Fresh weight of the stems (gm):-

It is clear from Table (13) and Fig.(12) that the fresh weight of stem was affected with the different dates of the seeds collection. The heaviest fresh weight of the stem resulted from the seeds collected in the second date (15th Dec.) in the two seasons, with the means of 12.98 and 10.83 gms for the first and second seasons, respectively. On the contrary, the least weight was produced from the seeds collected in the fourth date (15th Feb.) in the two seasons, with the means of 2.14 and 2.19 gms for the first and second season, respectively. The differences among the effect of the different dates of the seed collection on the fresh weight of stem were significant in the two seasons most cases. These results are in harmony with those obtained **Sharma *et al.* (1996)** on *Acacia catechu*, who found that, the seeds collection on December 10 from trees gave the greatest shoot (36.96 cm) length.

Table (13):-Effect of date of seed collection on the fresh weight (gm) of *Albizzia lebbeck* Benth. seedlings at age of 9 months after sowing during 1999/2000 and 2000/2001 seasons.

Seasons	1999/2000				2000/2001			
Date of seed collection	Fresh weight (g/plant)				Fresh weight (g/plant)			
	Stem	Leaves	Roots	Nodules	Stem	Leaves	Roots	Nodules
D(I) 15th Nov.	5.64	11.49	16.79	1.56	5.97	12.26	17.24	1.98
D(II) 15th Dec.	12.23	16.04	13.72	4.05	10.83	15.52	17.72	4.40
D(III) 15th Jan.	6.40	10.05	16.02	0.43	4.48	7.43	6.36	0.52
D(IV) 15th Feb.	2.14	3.82	4.42	0.25	2.19	2.64	4.59	0.32
D(V) 15th Mar.	3.03	3.36	11.12	0.65	2.35	2.47	5.53	0.69
L.S.D. at 5%	0.74	1.70	1.42	0.16	1.12	2.23	2.01	0.55

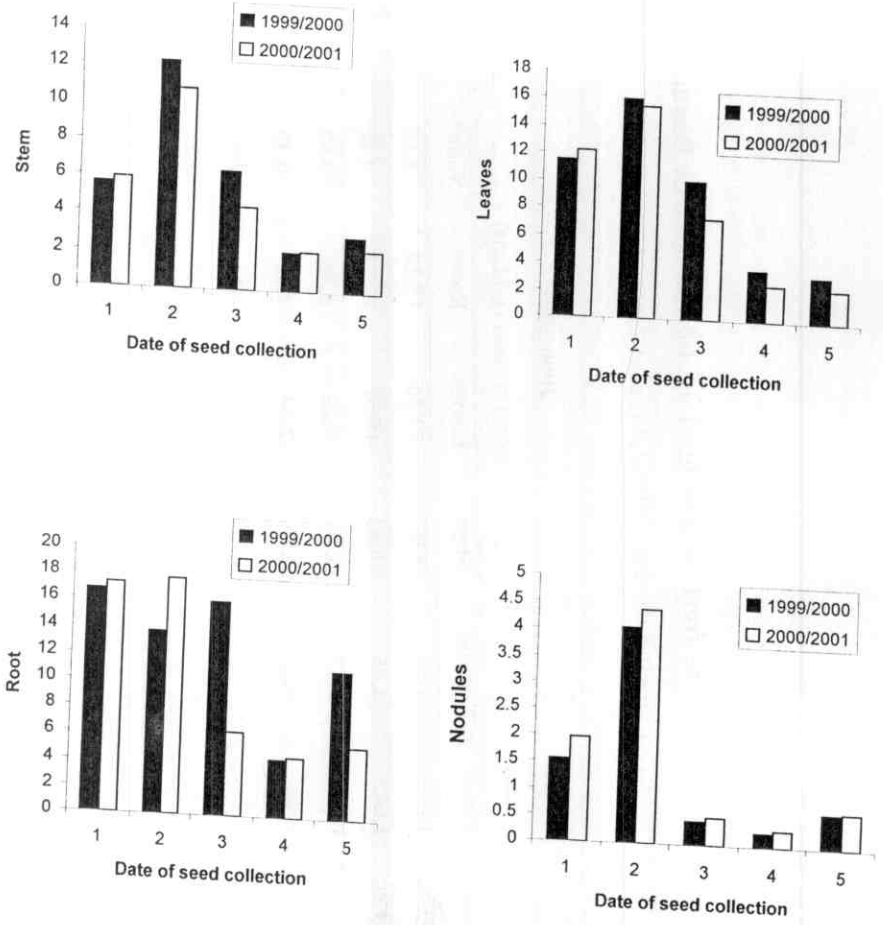


Figure (12): Effect of date of the seed collection on the fresh weight (gm) *Albizzia lebbeck* Benth. seedlings at age of 9 months after sowing during 1999/2000 and 2000/2001 seasons.

P.N.:-(1) The first date (15th Nov.).
(2) The second date (15th Dec.).
(3) The third date (15th Jan.).
(4) The fourth date (15th Feb.).
(5) The fifth date (15th Mar.).

A-4-2. Fresh weight of the leaves (gm):-

Data in Table (13) and Fig. (12) show, the effect of seeds collection at different dates on the fresh weight of the leaves. The heaviest fresh weight of the leaves was obtained from seeds collected in the second date (15th Dec.) in the two seasons, with the means of 16.04 and 15.52 gms for the first and second seasons, respectively. On the other hand, in the two seasons, the seeds collected in the fifth date (15th Mar.) gave the least weight of leaves with the means of 3.36 and 2.47gms for the first and second seasons, respectively. The differences between the different dates of the seeds collection which gave the heaviest fresh of the leaves and the least weight of the leaves were significant in the two seasons.

A-4-3. Fresh weight of the roots (gm):-

Data Table (13) and Fig. (12), indicate that the heaviest fresh weight of roots was produced from the seeds collected in the first date (15th Nov.) in the first season with the mean of 16.79 gms. While, in the second season, the seeds collected in the second date (15th Dec.) and the first date (15th Nov.) gave means of 17.72 and 17.24 gms, respectively with non- significant differences between them selves. On the contrary, the lightest fresh weight of the roots resulted from the seeds collected in the fourth date (15th Feb.) in the two seasons, with the means of 4.42 and 4.59 gms for the first and second seasons, respectively. The differences between the different dates of the seeds collection which gave the heaviest fresh weight of the roots and the lightest fresh weight of the roots were significant in the two seasons.

A-4-4. Fresh weight of nodules on the roots (gm):-

Table (13) and Fig. (12) show, the effect of the seeds collection in different dates on the fresh weight of nodules on the roots. The heaviest fresh weight of the nodules on the roots was produced from the seeds collected in the second date (15th Dec.) in the two seasons, with the means of 4.05 and 4.40 gms for the first and second season, respectively. On the other hand, in the two seasons, the seeds collected in the fourth date (15th Feb.) gave the lightest fresh weight of nodules on the roots with the means of 0.25 and 0.32 gm for the first and second season, respectively. There are significant difference between the different dates of seeds collection on the fresh weight of nodules on roots in the first season only.

A-5. Effect of the date of seed collection on the dry weight of *Albizzia lebbeck* Benth. seedlings at age of 9 months after sowing during 1999/2000 and 2000/2001 seasons:-

A-5-1. Dry weight of the stem (gm):-

Generally, the dry weight of the stem took a similar trend as that in the fresh weight of stem. It is clear from the data Table (14) and Fig.(13) that the heaviest dry weight of stem was obtained from the seeds collected in the second date (15th Dec.) in the two seasons, with the means of 4.24 and 4.40 gms for the first and second season, respectively. On the other hand, in the two seasons, the seeds collected in the fourth date (15th Feb.) gave the lightest dry weight of the stems with the means of 1.07 and 1.09 gms for the first and second seasons, respectively. The effect of the differences among the effect of the different dates of the seeds collection which gave the heaviest and the lightest dry

Table (14):-Effect of date of seed collection on the dry weight (gm) of *Albizzia lebbeck* Benth. seedlings at age of 9 months after sowing during 1999/2000 and 2000/2001 seasons.

Seasons	1999/2000				2000/2001			
Date of seed collection	Dry weight (g/plant)				Dry weight (g/plant)			
	Stem	Leaves	Roots	Nodules	Stem	Leaves	Roots	Nodules
D(I) 15th Nov.	2.67	3.05	7.71	0.28	2.92	3.29	7.78	0.31
D(II) 15th Dec.	4.24	4.66	7.26	1.18	4.40	4.96	8.47	1.33
D(III) 15th Jan.	3.29	5.92	8.68	0.17	1.88	2.54	2.64	0.20
D(IV) 15th Feb.	1.07	1.38	2.41	0.08	1.09	1.16	2.56	0.09
D(V) 15th Mar.	1.64	1.70	5.06	0.19	1.29	0.88	2.64	0.20
L.S.D. at 5%	0.37	0.55	0.34	0.07	0.57	0.70	0.55	0.23

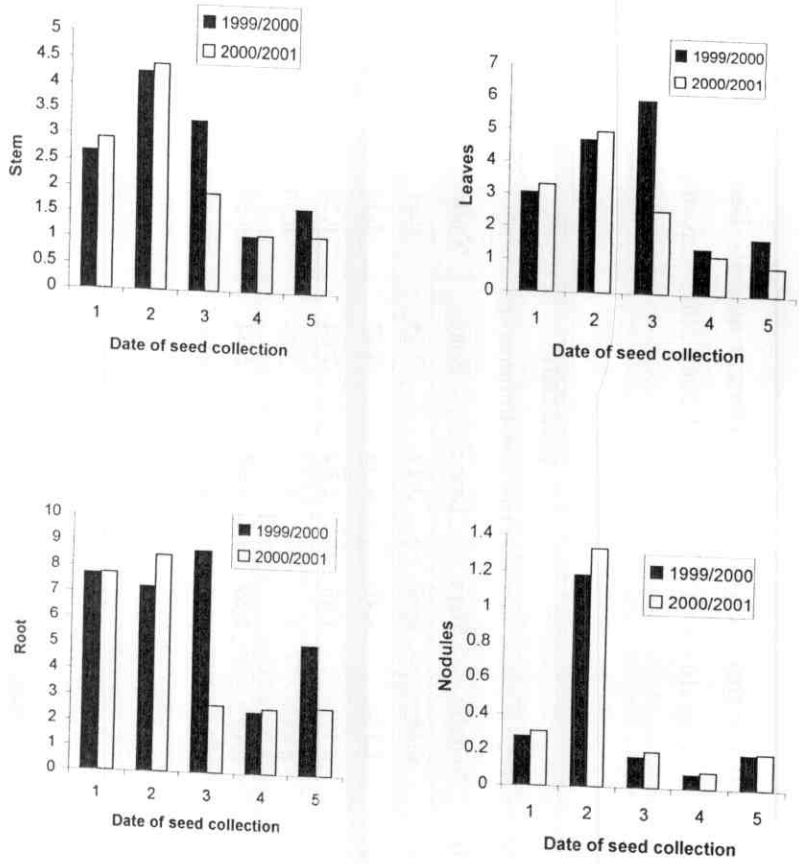


Figure (13): Effect of date of the seed collection on the dry weight (gms) of *Albizzia lebbeck* Benth. seedlings at age of 9 months after sowing during 1999/2000 and 2000/2001 seasons.

P.N.:-(1) The first date (15th Nov.).
(2) The second date (15th Dec.).
(3) The third date (15th Jan.).
(4) The fourth date (15th Feb.).
(5) The fifth date (15th Mar.).

weight of stems were significant in the two seasons. The reason may be due to the enzymes activity that degrade the complex materials in the seeds and the release sugars and amino acid which enable the embryo to grow heterophically.

A-5-2. Dry weight of the leaves (gm) :-

In the first season, it is clear from the data in Table (14) and Fig. (13) that the dry weight of the leaves/seedling from the seeds collected in the third date (15th Jan.) was the heaviest with the mean of 5.92 gms . While, in the second season, the heaviest dry weight of the leaves resulted from the seeds collected in the second date (15th Dec.) with the mean of 4.96 gms. On the contrary, in the first season, the seeds collected in the fourth (15th Feb.) gave the lightest dry weight of the leaves with mean of 1.38 gm. But, in the second season, the lightest dry weight of leaves was produced from the seeds collected in the fifth date (15th Mar.) with the mean of 0.88 gm . The differences between the effect of the different dates of seeds collection which gave the heaviest dry weight of the leaves and the lightest dry weight were significant in the two seasons.

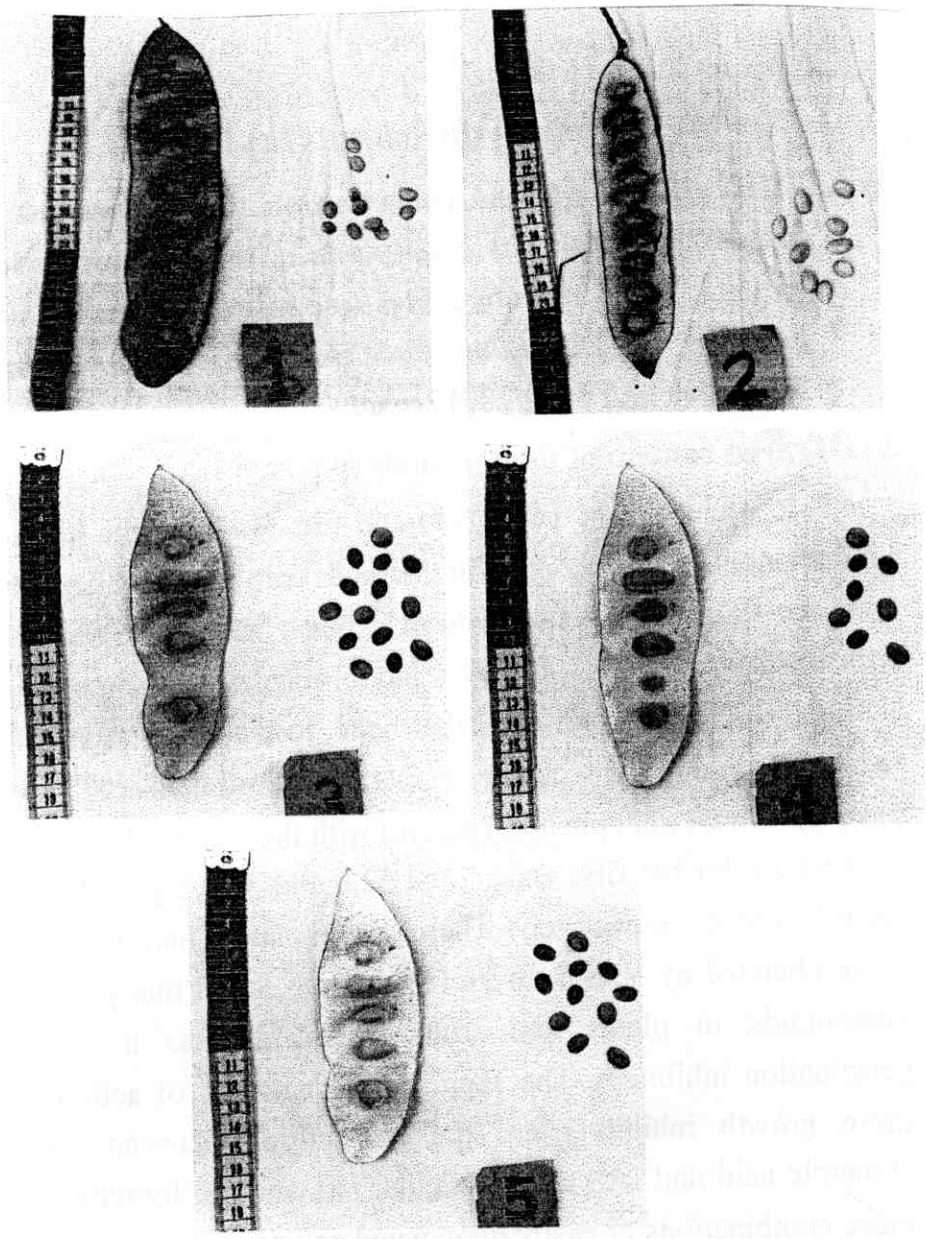
A-5-3. Dry weight of the roots (gm):-

As shown in Table (14) and Fig.(13) the dry weight of the root was markedly affected by seeds collection in the different dates. In the first season, the heaviest dry weight of the roots resulted from the seeds collected in the third date (15th Jan.) with mean of 8.68 gms. While, the seeds collected in the second date (15th Dec.), in the second season, gave the heaviest dry weight of the roots with the mean of 8.47 gms. On the other hand, the highest dry weight of roots in the two seasons was produced

from the seeds collected in the fourth date (15th Feb.) with the means of 2.41 and 2.56 gms for the first and second seasons, respectively. The differences among the different dates of seed collection which gave the heaviest dry weight of the roots and the lightest dry weight of roots were significant in the two seasons. These results are in harmony with those obtained by **Srimathi *et al* (2001)** who found that seedling number, dry matter production and vigour index of *Syzygium cumini* showed increased physical characteristics of fruit and seed quality with the increase in age.

A-5-4. Dry weight of nodules on the roots (gm):-

Generally, the dry weight of the nodules on the roots took a similar trend as that in the fresh weight of the nodules on the roots. It is clear from Table (14) and Fig. (13) that the seeds collected in the second date (15th Dec.) in the two seasons gave the heaviest dry weight of nodules with the means of 1.18 and 1.33 gms for the first and second seasons, respectively. On the contrary, in the two seasons, the lightest dry weight of nodules resulted from the seeds collected in the fourth date (15th Feb.) with the means of 0.08 and 0.09 gm for the first and second seasons, respectively. The differences among the effect of the different dates of seeds collection which gave the heaviest dry weight of the nodules and the lightest dry weight of the nodules on the roots were significant in the two seasons.



Photog.(8):- Effect of the date of seed collection on the seeds color of *Albizzia lebbeck* (L.) Benth.

P.N.:- **(1)** The first date (15th Nov.).
(2) The second date (15th Dec.).
(3) The third date (15th Jan.).
(4) The fourth date (15th Feb.).
(5) The fifth date (15th Mar.).

B- Taxodium distichum (L.) Rich.

B-1. Effect of date of seed collection on the seed chemical content of total phenols (p.p.m.); total amino acids (p.p.m.); total carbohydrates (p.p.m.) and total indoles (p.p.m.) of *Taxodium distichum* (L.) Rich. during 1999/2000 and 2000/2001 seasons:

B-1-1. Seed content of total phenols (p.p.m.):

It is clear from Table (15) and Fig. (14) that the highest total phenols (p.p.m.) content in the seeds was produced from the seeds collected in the first date (15th Sep.) in the two seasons, with the means of 47.0 and 62.5 p.p.m. for the first and second seasons, respectively. On the other hand, in the two seasons, the seeds collected in the second (15th Oct.) and third date (15th Nov.) gave the lowest total phenols (p.p.m.) with the means of 39.3 and 40.3 p.p.m. for the first season and 52.8 and 50.9 p.p.m. for the second season, respectively. These results are in harmony with those obtained by **Van Sumere (1960)** who found that phenolic compounds in plants and fruits, might act, as a natural germination inhibitors. The suggested mechanism of action for these growth inhibitors are the competition between trans-cinnamic acid and IAA at a particular site and the formation of loose combinations or easily dissociated coumarin compounds of enzymes or plant cell metabolites. Also was the findings of **Thimann and Bonner (1949)** who suggested that many compounds react with sulfhydryl group (SH) of enzymes by the unsaturated lactones, coumarin and protoanemonin and the mechanism of action of these inhibitors was at the molecular level.

Table (15): Effect of date of seed collection on the seeds chemical content of total phenols (p.p.m.); total amino acids (p.p.m.); total carbohydrates (p.p.m.) and total indoles (p.p.m.) of *Taxodium distichum* (L.) Rich . during 1999/2000 and 2000/2001 seasons.

Date of seed collection	1999/2000				2000/2001			
	Total phenols	Total amino acids	Total carbohydrates	Total indoles	Total phenols	Total amino acids	Total carbohydrates	Total indoles
D (I) 15th Sep.	47.0	44.7	62.5	57.9	62.5	29.1	64.0	56.9
D (II) 15th Oct.	39.3	94.9	68.0	40.3	52.8	99.2	68.6	37.8
D (III) 15th Nov.	40.3	86.8	111.5	52.7	50.8	71.4	110.9	46.9
D (IV) 15th Dec.	44.5	73.6	36.9	64.3	59.5	61.7	37.4	60.2

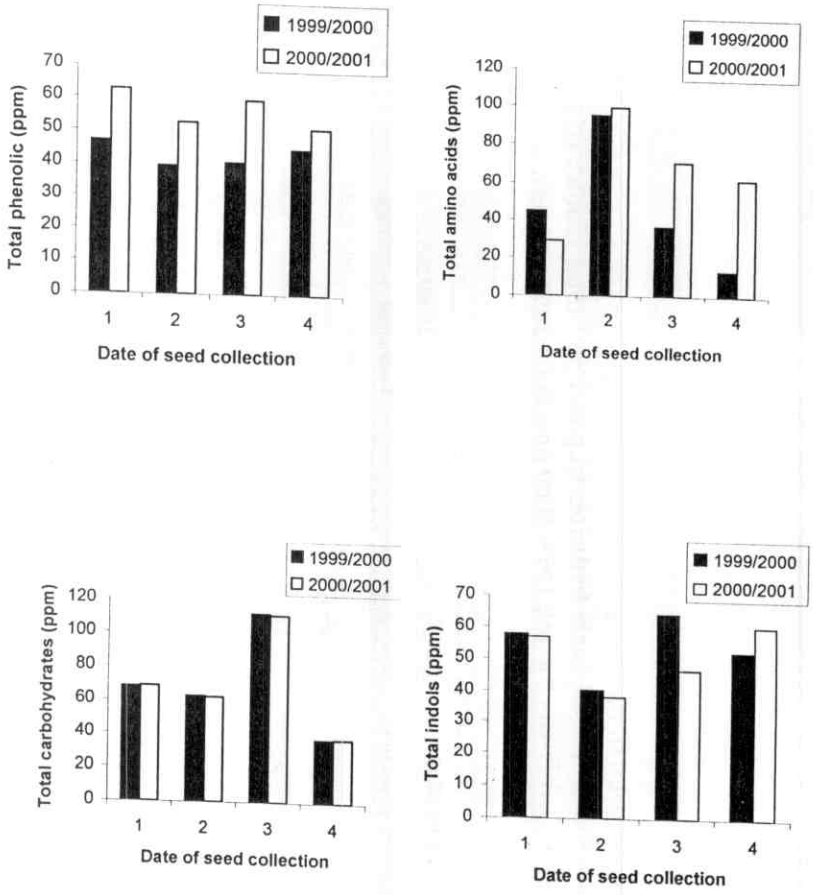


Figure (14): Effect of date of the seed collection on the seeds chemical content of total phenols (ppm); total amino acids (ppm); total carbohydrates (ppm) and total indoles (ppm.) of *Taxodium distichum* (L.) Rich. during 1999/2000 and 2000/2001 seasons.

P.N.:-(1) The first date (15th Sep.).
(2) The second date (15th Oct.).
(3) The third date (15th Nov.).
(4) The fourth date (15th Dec.).

B-1-2. Seed content of total amino acids (p.p.m.):-

Table (15) and Fig. (14) show the effect of the seeds collection in different dates on the seed content of total amino acids. The seeds collected in the second date (15th Oct.) in the two seasons, gave the highest total amino acids with the means of 94.9 and 99.2 p.p.m. for the first and second season, respectively. On the contrary, the lowest total amino acids resulted from the seeds collected in the first date (15th Dec.) with the means of 44.7 and 29.1 p.p.m. for the two seasons, respectively.

B-1-3. Seed content of total carbohydrates (p.p.m.) :-

Data in Table (15) and Fig. (14) show the effect of seeds collection in the different dates on total carbohydrates content for the two seasons. The highest total carbohydrates was obtained from the seeds collected in the third date (15th Nov.) in the two seasons, with the means of 111.5 and 110.9 p.p.m. for the first and second seasons, respectively. On the other hand, in the two seasons, the seeds collected in the fourth date (15th Dec.) gave the lowest total carbohydrates with means of 36.9 and 37.429 p.p.m. for the first and second seasons, respectively.

B-1-4. Seed content of total indoles (p.p.m.):-

The seed content of total indoles was effected significantly with the seed collection at different dates (Table 15 and Fig. 14). In the two seasons, the highest total indoles resulted from the seeds collectd in the fourth date (15th Dec.) with the means of 64.3 and 60.2 p.p.m. in the first and second seasons, respectively. On the contrary, in the two seasons, the lowest total indoles resulted from the seeds collected in the second date (15th

Oct.) with the means of 40.3 and 37.8 p.p.m. for the first and second season, respectively.

These results are in agreement with those of **Barton (1965) and Pillay (1966)** who pointed out that dormancy and germination are the many plant growth responses that are probably controlled by the balance of growth inhibitors and promoters. This balance seems to be shifted in favour of the inhibitory-substances during seed maturation, resulting in resting conditions.

B-2. Effect of date of seed collection on the weight of 100 seeds (gm) seeds moisture content (%); germination percentage (%); rate and periodicity (days) of *Taxodium distichum* (L.) Rich. during 1999/2000 and 2000/2001 seasons:-

B-2-1. Weight of 100 seeds (gm):-

Data concerning the effect of seeds collecting dates on the weight of 100 seeds are presented in Table (16) and Fig. (15) for the two seasons. The heaviest weight of 100 seeds resulted from the seeds collected in the second date (15th Oct.) for both seasons with the means of 5.89 and 5.55 gms in the first and second seasons, respectively. On the other hand, the seeds collected in the fourth date (15th Dec.) gave the lightest weight in the two seasons, with means of 2.14 and 2.13 gms for the first and second seasons, respectively. The differences between the dates of seeds collection which gave the heaviest and lightest weight of 100 seeds were significant in the two seasons. The fact that seeds collection in the second date (15th Oct.) were the heaviest

Table (16):- Effect of date of seed collection on the weight of 100 seeds; seed moisture (%); germination percentage; rate and periodicity of *Taxodium distichum* (L.) Rich. during 1999/2000 and 2000/2001 seasons.

Seasons	1999/2000					2000/2001				
Date of seed collection	Weight of 100 seeds (gm)	seeds Moistue (%)	Germinatin percentage (%)	Germinatin rate	Germinatin periodicity (days)	Weight of 100 seeds (gm)	seeds Moistue (%)	Germinatin percentage (%)	Germinatin rate	Germinatin periodicity (days)
D(I) 15th Sep.	5.61	71.89	23.25	1.83	13.59	5.41	61.85	26.50	3.60	10.87
D(II) 15th Oct.	5.89	51.80	27.75	2.29	12.83	5.55	43.39	35.75	4.60	11.25
D(III) 15th Nov.	2.83	36.60	37.00	3.59	12.58	2.72	34.98	44.75	5.63	12.70
D(IV) 15th Dec.	2.14	34.95	17.75	0.90	11.21	2.13	33.33	17.75	1.99	8.07
L.S.D. at 5%	0.77	2.21	1.66	0.83	2.40	0.61	2.04	3.46	1.33	1.25

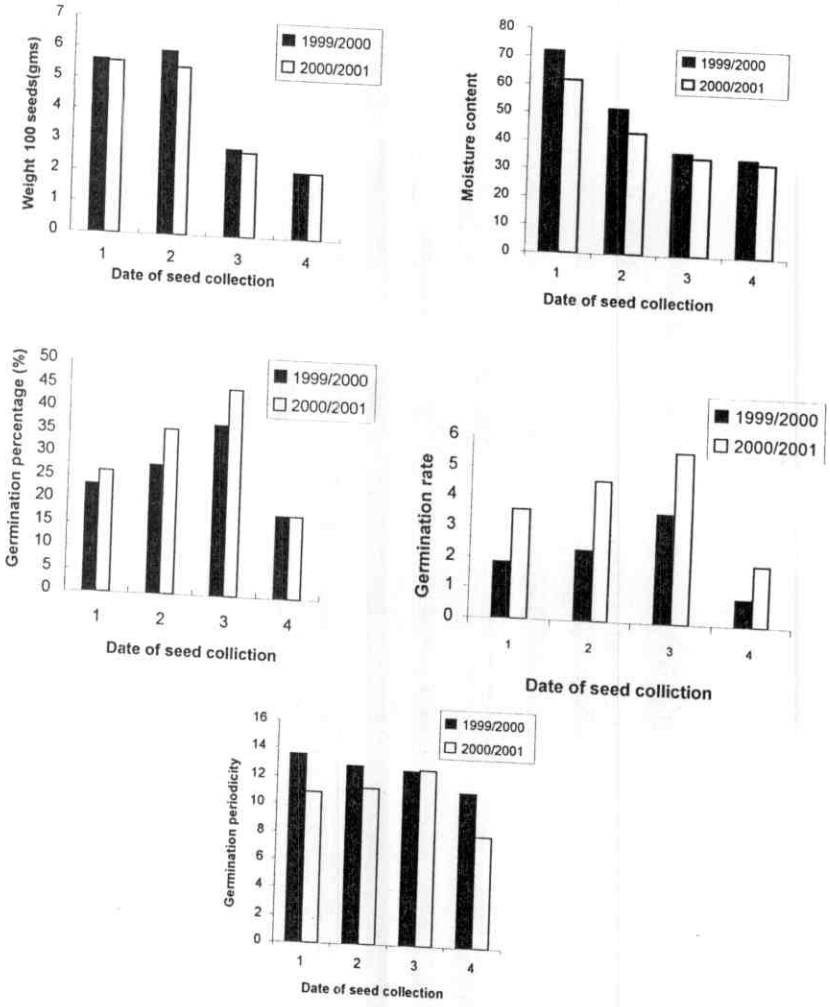


Figure (15): Effect of date of seed collection on the weight of 100 seeds, seed moisture (%), germination percentage, rate and periodicity of *Taxodium distichum* (L.) Rich. during 1999/2000 and 2000/2001 seasons.

P.N.:-(1) The first date (15th Sep.).
(2) The second date (15th Oct.).
(3) The third date (15th Nov.).
(4) The fourth date (15th Dec.).
(5) The fifth date (15th Jan.).

may was due to more moisture contents. Also the seeds collected in the second date (15th Oct.) did not ripe completely.

These results agree with those of, **Moncur *et al.* (1990)** on *Melia azedarach* var australasica, who found that viable seeds were obtained from green fruit which had reached maximum dry weight.

B-2-2. Seeds moisture content (%):-

Data in Table (16) and Fig. (15) show that, the highest seed moisture (%) in the two seasons, resultad from the seeds collected in the first date (15th Sep.) with the means of 71.89 and 61.85 % for the first and second seasons, respectively. On the other hand, in the two seasons, the lowest seed moisture (%) was found in the seeds collected in the fourth date (15th Dec.) with the means of 34.95 and 33.33 % for the first and second seasons, respectively. There were significant differences among the effect of the different dates of seeds collection on the moisture (%) in the two seasons. These results are in agreement with those of **Negi and Todaria (1995)** who studied seeds of 5 forest trees species i.e. *Acer oblongum, Kydia calyciana, Terminalia chebula, T. tomentosa* and *T. belerica* and found that the percentage of seed moisture decreased with increasing maturity.

B-2-3. Germination percentage (%):-

It is clear from Table (16) and Fig. (15) that, the germination percentage was affected with the different dates of seeds collection; the highest percentage of germination was obtained from the seeds collected in the third date (15th Nov.) in the two seasons, with the means of 37.00 and 44.75 % for the first and second seasons, respectively. On the contrary, the

lowest germination percentage resulted from the seeds collected in the fourth date (15th Dec.) in the two seasons, with the mean of 17.75% for each season. The differences among the dates of seed collection which gave the highest germination percentage in the third date and the other dates were significant in the two seasons. This may be due to various changes in the level of different anabolism processes. These results agree with the findings of **Flemion (1933)** who indicated that physiological dormancy is due to germination inhibitors present in the seeds as with ash (Fraxinus). In those seeds with an embryo capable of germination if removed from the seed, dormancy is commonly associated with inability of the embryo to mobilize and utilize reserve material from the endosperm or cotyledons.Also were the results of **Krysztofik (1987)** who found that yew [*Taxus baccata*] had high germination (96.7-100 %) of seeds from ripe fruit colleted in Aug. or Sep. **Sangakkara (1993)** on seeds of nutmeg *Myristica fragrans* Houtt. found that final germination percentages were 65, 75 and 90 % for fully mature, fully ripe and freshly fallen seeds, respectively. Also the finding of **Negi and Todaria (1995)** on seeds of 5 forest trees species i.e. *Acer oblongum, Kydia calyciana, Terminalia chebula; T. tomentosa* and *T. Belerica* who found that no germination was recorded in the first 2 collections of *K. Calycina* and the first collection of *T. tomentosa.* All species exhibited increased germination with time except for *T. chebula*, wich showed better germination (26.67%) at the third collection, while the other species performed better in the last collection. *A. oblongum* seeds started germinating in the first collection and maximum germination (83.33%) was recorded in the last. There were significant differences in the

germination of different collection groups. In *T. Bellirica* maximum germination (96.67%) was recorded at the last collection. Germination was most in *T. bellirica* (96.67%) and least in *T. chebula* (26.67%).

B-2-4. Germination rate:-

It is clear from Table (16) and Fig.(15) that, the different dates of seeds collection influenced the seed germination rate in the two seasons. The highest germination rate in the two seasons, resulted from the seeds collected in the third date (15th Nov.) with the means of 3.59 and 5.63 for the first and second seasons, respectively. On the other hand, the seeds collected in the fourth date (15th Dec.) gave the lowest germination rate in the two seasons with the means of 0.90 and 1.99 for the first and second seasons, respectively. The differences among the effect of the dates of seeds collection which gave the highest germination rate and those which gave the lowest germination rate were significant in the two seasons.

The seed collection in the fourth date (15th Dec.) which gave the lowest germination rate may be due to the phenols level in the seed which compete with IAA and other growth hormones and restrict respiration of the embryo. These results agreed with those of **Van Sumere (1960)** who reported that phenolic compounds in plants and fruits, might act, as a natural germination inhibitors. Furthermore, **Thimann and Bonner (1949)** suggested that many compounds react with sulfhydryl group (SH) of enzymes by the unsaturated lactones, coumarin and protoanemonin and the mechanism of action of these inhibitors was at the molecular level.

B-2-5.Germination periodicity (days):-

It is clear from Table (16) and Fig.(15) that the germination periodicity was affected with the different dates of the seed collection, in the two seasons. The highest germination periodicity resulted from the seeds collected in the first date (15th Sep.) with the mean of 13.59 days for the first season and the seeds collected in the third date (15th Nov.) with the mean of 12.70 days for the second season. On the other hand, in the two seasons, the lowest germination periodicity resulted from the seeds collected in the fourth date (15th Nov.) with the means of 11.21 and 8.07 days for the first and second seasons, respectively. The differences between the different dates of the seeds collection which gave the highest and lowest germination periodicity were significant in the two seasons.

B-3. Effect of date of seed collection on the growth of *Taxodium distichum* (L.) Rich. seedlings at age of 9 months after sowing during 1999/2000 and 2000/2001 seasons:-

B-3-1. Plant height (cm):-

As for the effect of the seeds collection in different dates on the plant height, it is clear from Table (17) and Fig.(16) that the seeds collected in the second date (15th Oct.) gave the tallest stems in the two seasons, with the means of 35.68 and 45.87 cm in the first and second seasons, respectively. On the contrary, the shortest stems resulted from the seeds collected in the third date (15th Nov.) with the mean of 24.32 cm for the first season. While, the seeds collected in the first date (15th Sep.) gave the shortest stems in the second season, with the mean of 32.06 cm.

Table (17):-Effect of date of seed collection on the growth of *Taxodium distichum* (L.) Rich. seedlings at age of 9 months after sowing during 1999/2000 and 2000/2001 seasons.

Seasons	1999/2000				2000/2001			
Date of seed collection	Plant height (cm)	Number of leaves/ plant	Thickness of stem/ plant (mm)	Root length/ plant (cm)	Plant height (cm)	Number of leaves/ plant	Thickness of stem/ plant (mm)	Root length/ plant (cm)
D(I) 15th Sep.	33.21	24.58	3.69	52.83	32.06	22.54	3.54	50.75
D(II) 15th Oct.	35.68	34.03	3.83	56.45	45.87	37.04	4.15	45.09
D(III) 15thNov.	24.32	16.31	3.39	53.11	37.17	25.67	3.64	41.62
D(IV) 15th Dec.	25.49	17.00	3.14	65.51	43.23	34.16	4.30	43.95
L.S.D. at 5%	4.35	4.12	0.20	5.33	1.64	3.91	0.21	5.91

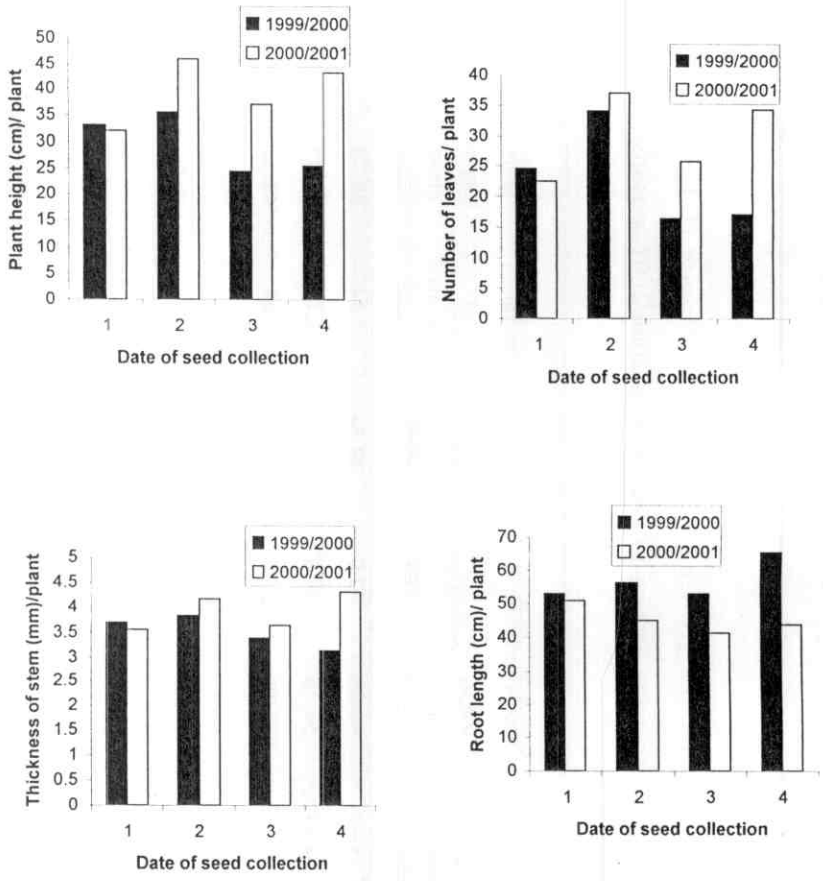


Figure (16): Effect of date of the seed collection on the growth of *Taxodium distichum* (L.) Rich. seedlings at age of 9 months after sowing during 1999/2000 and 2000/2001 seasons.

P.N.:-(1) The first date (15th Sep.).
(2) The second date (15th Oct.).
(3) The third date (15th Nov.).
(4) The fourth date (15th Dec.).

The differences among the dates of seeds collection which gave the tallest stems and the shortest stems were significant in the two seasons.

B-3-2. Number of leaves /plant:-

The number of leaves was affected with seeds collection in different dates (Table 17 and Fig.16). The largest number of leaves was obtained from the seeds collected in the second date (15th Oct.) in the two seasons, with means of 34.03 and 37.04 leaves/plant for the first and second seasons, respectively. The seeds collected in the third date (15th Nov.) gave the minimum number of leaves as 16.31 leaves/plant for the first season. While, in the second season the seeds collected in the first date (15th Sep.) gave the minimum number of leaves as 22.54 leaves/plant. The differences among the dates of seeds collection which gave the largest number of leaves and minimum number of leaves were significant in the two seasons.

B-3-3. Thickness of stem (mm):-

It is clear from, Table (17) and Fig. (16) that the seeds collected in different dates had a significant effect on the stem thickness of the seedling. The seeds collected in the second date (15th Oct.) gave the thickest seedling with a mean of 3.83 mm for the first season. The seeds collected in the fourth (15th Dec.) and the second date (15th Oct.) gave the thickest seedling with the means of 4.30 and 4.15 mm, respectively, in the second season. On the other hand, the thinnest seedlings were obtained from the seeds collected in the fourth date (15th Dec.) in the first season, with the mean of 3.14 mm. In the second season, the seed collection in first (15th Sep.) and third date (15th Nov.) gave the

thinnest seedlings with the means of 3.54 and 3.64 mm, respectively. The differences among the effect of dates of the seeds collection which gave the thickest and the thinnest seedlings were significant in the two seasons. However, the variation may be ignored.

B-3-4. Root length (cm):-

As it is clear from Table (17) and Fig. (16) that the root length was affected with seeds collection in the different dates. The longest roots resulted from the seeds collectd in the fourth date (15th Dec.) in the first season with the mean of 65.51 cm. While, the seeds collected in the first date (15th Sep.) gave the tallest roots with the mean of 50.75 cm for the second season. On the other hand, in the first season, the shortest roots were obtained from the seeds collected in the first date (15th Sep.) with the mean of 52.83 cm. While, the shortest roots resulted from the seeds collected in the third date (15th Nov.) with the mean of 41.62 cm in the second season. The differences among the effect of different date on the root length in the two seasons were significant in most cases. These results agreed with the findings of **Sharma *et al.* (1996)** on *Acacia catechu*, who found the seeds collection on December 10 from trees gave the greatest root length.

B-4. Effect of date of seed collection on the fresh weight of *Taxodium distichum* (L.) Rich. seedlings at age of 9 months after sowing during 1999/2000 and 2000/2001 seasons:-

B-4-1. Fresh weight of the stem (gm):-

It is clear from Table (18) and Fig.(17) that the fresh weight of stem was affected with the seeds collection in different dates in the two seasons. The heaviest fresh weight of the stem was obtained from the seeds collected in the second date (15th Oct.) with the mean of 1.67 gm for first season. While, in the second season, the seeds collected in the fourth date (15th Dec.) gave the heaviest fresh weight of the stem with the mean of 2.55 gms. On the other hand, the lightest fresh weight of the stem resulted from the seeds collected in the third (15th Nov.) and the fourth date (15th Dec.) with the mean of 0.70 gm for each in the first season. While, the seeds collected in first date (15th Sep.) gave the lightest fresh weight of stem in the second season, with mean of 1.17 gm. There are significant differences between the effect of the different dates of the seeds collection on the fresh weight of stem in the two seasons. The results are in line with the findings of **Negi and Todaria (1995)** on seeds of 5 forest trees species.

B-4-2. fresh weight of the leaves (gm):-

From Table (18) and Fig. (17) it is clear that the fresh weight of the leaves was affected with the seed collection dates. The heaviest fresh weight of leaves was obtained from the seeds collected in the second date (15th Oct.) with the mean of 2.95 gms for the first season. While, in the second season, the

Table (18):-Effect of date of seed collection on the fresh weight (gm) of *Taxodium distichum* (L.) Rich. seedlings at age of 9 months after sowing during 1999/2000 and 2000/2001 seasons.

Seasons	1999/2000			2000/2001		
Date of seed collection	Fresh weight (g/plant)			Fresh weight (g/plant)		
	Stem	Leaves	Roots	Stem	Leaves	Roots
D(I) 15th Sep.	1.30	2.17	1.73	1.17	2.03	1.56
D(II) 15th Oct.	1.67	2.95	1.69	1.81	3.33	1.24
D(III) 15thNov.	0.70	1.47	1.31	1.40	2.37	0.91
D(IV) 15th Dec.	0.70	1.41	0.85	2.55	3.71	1.81
L.S.D. at 5%	0.23	0.24	0.29	0.40	0.49	0.39

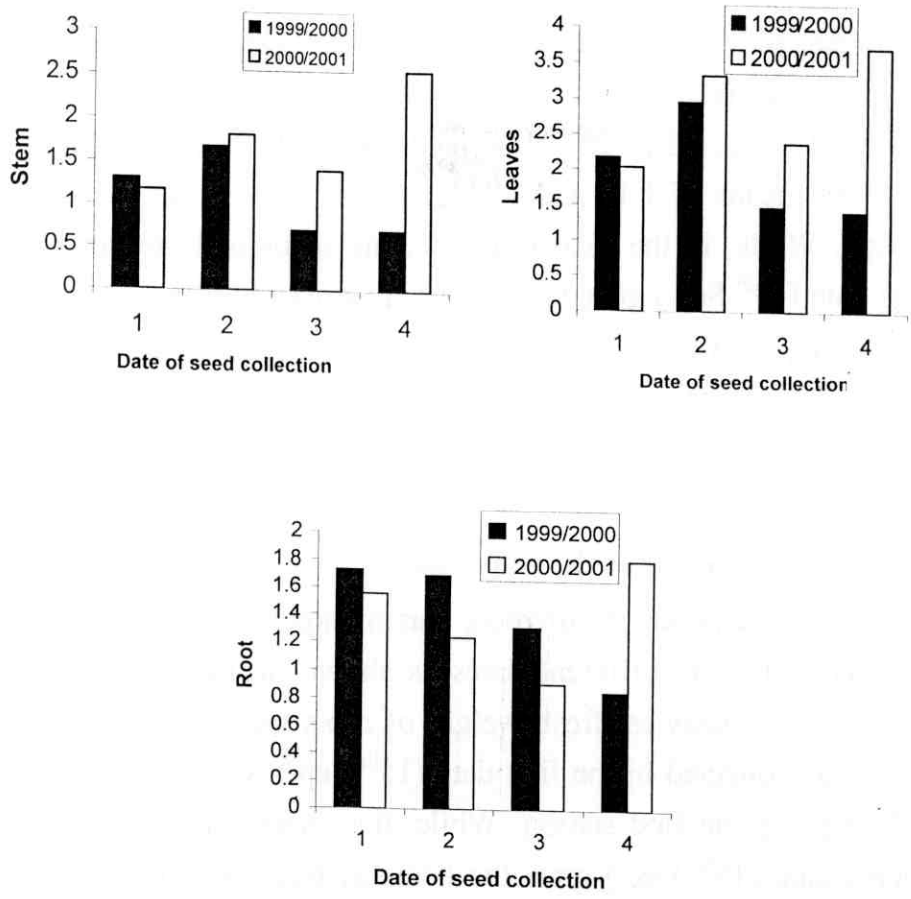


Figure (17): Effect of date of the seed collection on the fresh weight (gm) *Taxodium distichum* (L.) Rich. seedlings at age of 9 months after sowing during 1999/2000 and 2000/2001 seasons.

P.N.:-(1) The first date (15th Sep.).
(2) The second date (15th Oct.).
(3) The third date (15th Nov.).
(4) The fourth date (15th Dec.).

heaviest fresh weight of leaves resulted from the seeds collected in the fourth date (15th Dec.) and the second date (15th Oct.) with the means of 3.71 and 3.33 gms, respectively. On the other hand, the lightest fresh weight of leaves resulted from the seeds collected in the third (15th Nov.) and the fourth date (15th Dec.) with the means of 1.47 and 1.41 gms, respectively for the first season. While, in the second season, the seeds collected in the first date (15th Sep.) gave the lightest fresh weight of leaves with the mean of 2.03 gm. The differences among the effect of the dates of seeds collection which gave the heaviest fresh weight of the leaves and the lightest weight were significant in the two seasons.

B-4-3. Fresh weight of the roots (gm):-

The fresh weight of roots was markedly affected by the seed collection in different dates as shown in Table (18) and Fig.(17). The heaviest fresh weight of roots was obtained from the seeds collected in the first date (15th Sep.) with the mean of 1.73 gm for the first season. While, the seeds collected in the fourth date (15th Dec.) gave the heaviest fresh weight of roots with the mean of 1.81 gm for the second season. On the contrary, the seeds collected in the fourth date (15th Dec.) gave the lightest fresh weight of roots with the mean of 0.85 gm for the first season. While, in the second season, the lightest fresh weight of roots resulted from the seeds collected in the third date (15th Nov.) with the mean of 0.91 gm. The differences among the heaviest and lightest fresh weight of roots were insignificant.

B-5. Effect of date of seed collection on the dry weight of *Taxodium distichum* (L.) Rich. seedlings at age of 9 months after sowing during 1999/2000 and 2000/2001 seasons:-

B-5-1. Dry weight of the stem (gm):-

From Table (19) and Fig. (18) it is clear that the dry weight of the stem was affected with the seeds collection in different dates. The heaviest dry weight was obtained from the seeds collected in the second date (15th Oct.) with the mean of 0.75 gm for the first season. But, in the second season, the heaviest dry weight of stem resulted from the seeds collected in the fourth date (15th Dec.) with the mean of 1.13 gm. On the contrary, the lightest weight of stem was obtained from the seeds collected in the fourth (15th Dec.) and the third date (15th Nov.) with the means of 0.42 and 0.43 gm, respectively, for the first season. While, the lightest weight of stem resulted from the seeds collected in the first (15th Sep.) and the third date (15th Nov.) with the means of 0.67 and 0.69 gm for the second season, respectively. The differences in this respect were insignificant.

B-5-2. Dry weight of the leaves (gm):-

It is clear from Table (19) Fig. (18) that, dry weight of the leaves was affected with the seed collection at the different dates in the two seasons. The heaviest dry weight of leaves resulted from the seeds collected in the first (15th Sep.) and the second date (15th Oct.) with the means of 0.97 and 0.92 gm for the first season, respectively. While, in the second season, the seeds collected in the fourth date (15th Dec.) gave the heaviest dry

Table (19):- Effect of date of seed collection on the dry weight (gm) of *Taxodium distichum* (L.) Rich. seedlings at age of 9 months after sowing during 1999/2000 and 2000/2001 seasons.

Seasons	1999/2000			2000/2001		
Date of seed collection	Dry weight (g/plant)			Dry weight (g/plant)		
	Stem	Leaves	Roots	Stem	Leaves	Roots
D(I) 15th Sep.	0.68	0.97	0.79	0.67	0.97	0.78
D(II) 15th Oct.	0.75	0.92	1.17	0.77	1.10	0.86
D(III) 15thNov.	0.43	0.64	0.93	0.69	1.10	0.84
D(IV) 15th Dec.	0.42	0.62	0.53	1.13	1.43	0.44
L.S.D. at 5%	0.14	0.07	0.13	0.15	0.18	0.05

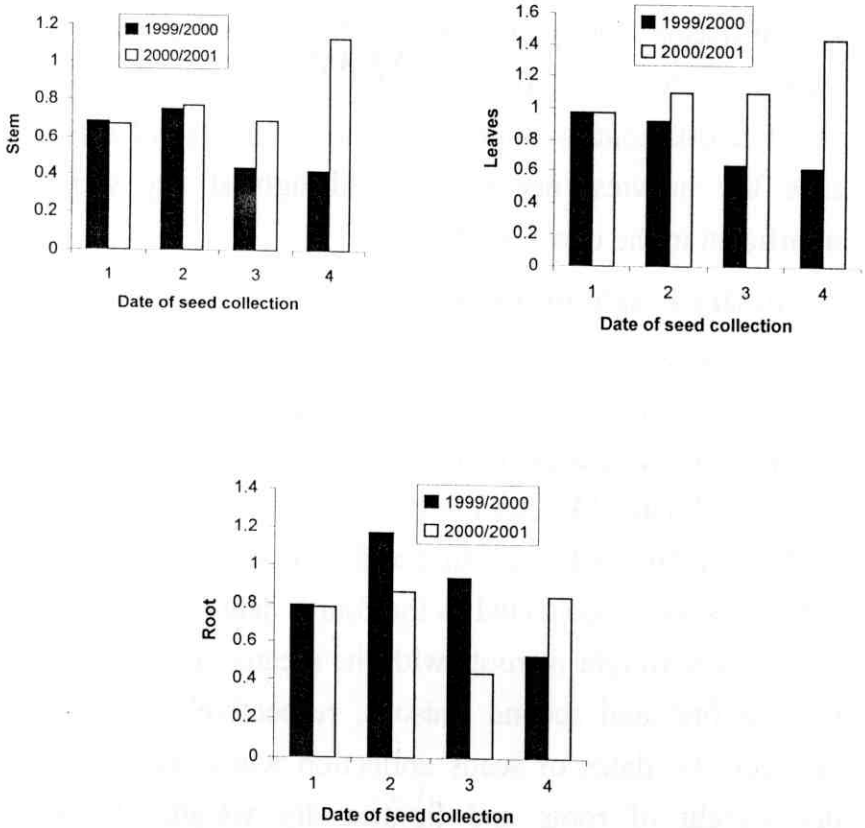


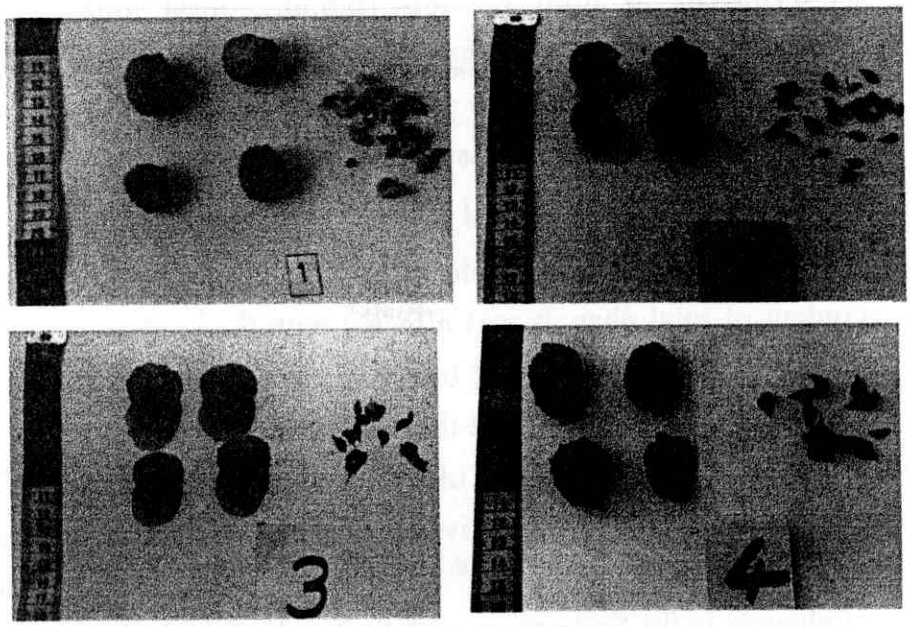
Figure (18): Effect of date of the seed collection on the dry weight (gm) of *Taxodium distichum* (L.) Rich. seedlings at age of 9 months after sowing during 1999/2000 and 2000/2001 seasons.

P.N.:-(1) The first date (15th Sep.).
(2) The second date (15th Oct.).
(3) The third date (15th Nov.).
(4) The fourth date (15th Dec.).

weight of the leaves with the mean of 1.43 gm. The lightest dry weight of leaves was obtained from the seeds collected in the fourth (15th Dec.) and the third date (15th Nov.) with the means of 0.64 and 0.62 gm for the first season, respectively. While, in the second season, the lightest dry weight of leaves resulted from the seeds collected in the first date (15th Sep.) with the mean of 0.97 gm. The differences among the dates of seeds collection which gave the heaviest dry weight and lightest dry weight were significant in the two seasons.

B-5-3. Dry weight of the roots (gm):-

The dry weight of roots was markedly affected by the seed collection in different dates (Table 19 and Fig. 18). The heaviest dry weight of the roots resulted from seeds collected in the second date (15th Oct.) in the two seasons, with the means of 1.17 and 0.86 gm for the first and second seasons, respectively. While, the seeds collected in the fourth date (15th Dec.) gave the lightest dry weight of roots with the means of 0.53 and 0.44 gm for the first and second seasons, respectively. The difference between the dates of seeds collection which gave the heaviest dry weight of roots and lightest dry weight of roots were significant in the two seasons. These results agreed with the findings of **Sharma *et al.* (1996)** on *Acacia catechu*, who found that, the seeds collection on December 10 from trees gave the greatest root weight.



Photog. (9): Effect of the date of seed collection on the seeds color of *Taxodium distichum* (L.) Rich.

P.N.:-(1) The first date (15th Sep.).

(2) The second date (15th Oct.).

(3) The third date (15th Nov.).

(4) The fourth date (15th Dec.).

C. *Cupressus sempervirens* L.

C-1. Effect of date of seed collection on the seed chemical content of total phenols (p.p.m.); total amino acids (p.p.m.); total carbohydrates (p.p.m.) and total indoles (p.p.m.) of *Cupressus sempervirens* L. during 1999/2000 and 2000/2001 seasons:-

C-1-1. Seed content of total phenols (p.p.m.):-

It is clear from Table (20) and Fig. (19) that the seed content of total phenols was affected with the seed collection at different dates. The highest total content of phenols in the two seasons, was produced from the seeds collected in the third date (15^{th} Nov.) with the means of 47.1 and 36.6 p.p.m. in the first and second seasons, respectively. On the other hand, the seeds collected in the first date (15^{th} Sep.) gave the lowest total content of phenols in the first season with the mean of 24.3. While, in the second season, this resulted from the fifth date (15^{th} Jan.) with the mean of 19.7 p.p.m..

The results are in line with the finding of **Krawiarz (1973)** who mentioned that among the pericarp inhibitors phenols as salycilic, oxibenzoic, cinnamic and some other acids exist. Different simple phenyl componds, however, were the most widely represented inhibitors including benzoic acid, the longer chained cinnamic acid series, and the lactones of these the coumarin series **(Bentley, 1958 and Lane and Bailey, 1964) Marbach and Mayer (1975)** found that the seed coats of the normally impereable species contain a rather high level of phenolic compounds and also of catechol oxidase. The action of catechol oxidase of these phenolic compounds is oxygen

Table (20):- Effect of date of seed collection on the seeds chemical content of total phenols (p.p.m.); total amino acids (p.p.m.); total carbohydrates (p.p.m.) and total indoles (p.p.m.) of *Cupressus sempervirens* L. during 1999/2000 and 2000/2001 seasons.

Date of seed collection	1999/2000				2000/2001			
	Total phenols	Total amino acids	Total carbohydrates	Total indoles	Total phenols	Total amino acids	Total carbohydrates	Total indoles
D (I) 15th Sep.	24.3	3.7	29.5	63.7	23.3	3.6	29.8	62.6
D (II) 15th Oct.	27.5	6.4	45.4	30.8	24.6	3.9	46.1	31.6
D (III) 15th Nov.	47.1	9.0	50.1	13.7	36.6	8.9	48.7	11.0
D (IV) 15th Dec.	31.2	4.5	36.8	14.5	29.6	4.8	36.6	13.5
D (V) 15th Jan.	28.8	3.6	34.6	43.7	19.7	3.4	35.0	43.9

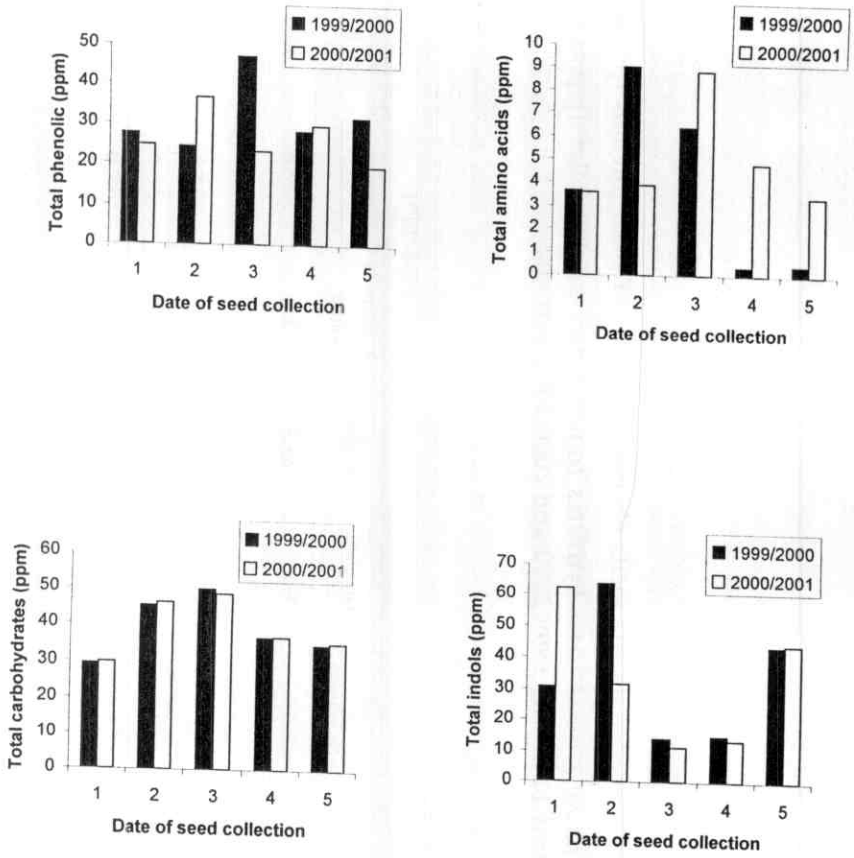


Figure (19): Effect of date of seed collection on the seeds chemical content of total phenols (ppm); total amino acids (ppm); total carbohydrates (ppm) and total indoles (ppm.) of *Cupressus sempervirens* L. during 1999/2000 and 2000/2001 seasons.

P.N.:-(1) The first date (15th Sep.).
(2) The second date (15th Oct.).
(3) The third date (15th Nov.).
(4) The fourth date (15th Dec.).
(5) The fifth date (15th Jan.).

C-2. Effect of the date of seed collection on the weight of 100 seeds (gm), seeds moisture content (%); germination percentage (%); rate and periodicity (days) of *Cupressus sempervirens* L. during 1999/2000 and 2000/2001 seasons:-

C-2-1. Weight of 100 seeds (gm):-

Data in Table (21) and Fig. (20) show that the seeds of ***Cupressus sempervirens*** collected in the third date (15th Nov.) gave the heaviest weight of 100 seeds in the two seasons, with the means of 0.86 and 0.84 gm for the first and second seasons, respectively. On the other hand, the seeds collected in first date (15th Sep) gave the lightest weight of 100 seeds with the means of 0.67 and 0.68 gm for the first and season seasons, respectively. The differences between the dates of seeds collection which gave the heaviest and lightest weight of 100 seeds were significant in the two seasons.

The fact that the seed collected in third date (15th Nov) in the two seasons were the heaviest may be due to more nutrient and more moisture contents. These results agreed with those of **Daniel *et al* .(1988)** on *Astronium concinnum* Schott. who found that when moisture content was > 60% seeds were non–viable. Also the findings of **Moncur *et al.* (1990)** on *Melia azedarach* var australasica, who found that viable seeds were obtained from green fruit which had reached maximum dry weight.

C-2-2. Seeds moisture content (%):-

Data in Table (21) and Fig. (20) show that, the highest moisture (%) in the two seasons, resultad from the seeds

Table (21):-Effect of date of seed collection on the weight of 100 seeds; seed moisture (%); germination percentage; rate and periodicity of *Cupressus sempervirens* L. during 1999/2000 and 2000/2001 seasons.

Seasons	1999/2000					2000/2001				
Date of seed collection	Weight of 100 seeds (gm)	seeds Moistue (%)	Germinatin percentage (%)	Germinatin rate	Germinatin periodicity (days)	Weight of 100 seeds (gm)	seeds Moisture (%)	Germinatin percentage (%)	Germinatn rate	Germinatin periodicity (days)
D(I) 15th Sep.	0.67	24.64	6.25	0.74	11.84	0.68	26.97	8.75	1.02	14.16
D(II) 15th Oct.	0.69	21.78	13.50	1.90	14.07	0.69	23.11	27.50	3.82	16.39
D(III) 15th Nov.	0.86	20.33	39.00	6.93	17.77	0.84	17.71	54.00	9.59	20.26
D(IV) 15th Dec.	0.81	18.02	11.75	1.83	15.58	0.83	15.69	26.00	4.04	18.04
D(V) 15th Jan.	0.78	17.96	2.25	0.14	6.22	0.77	15.63	6.25	0.42	9.22
L.S.D. at 5%	0.68	1.69	1.31	1.04	1.18	0.10	2.44	2.77	1.44	2.11

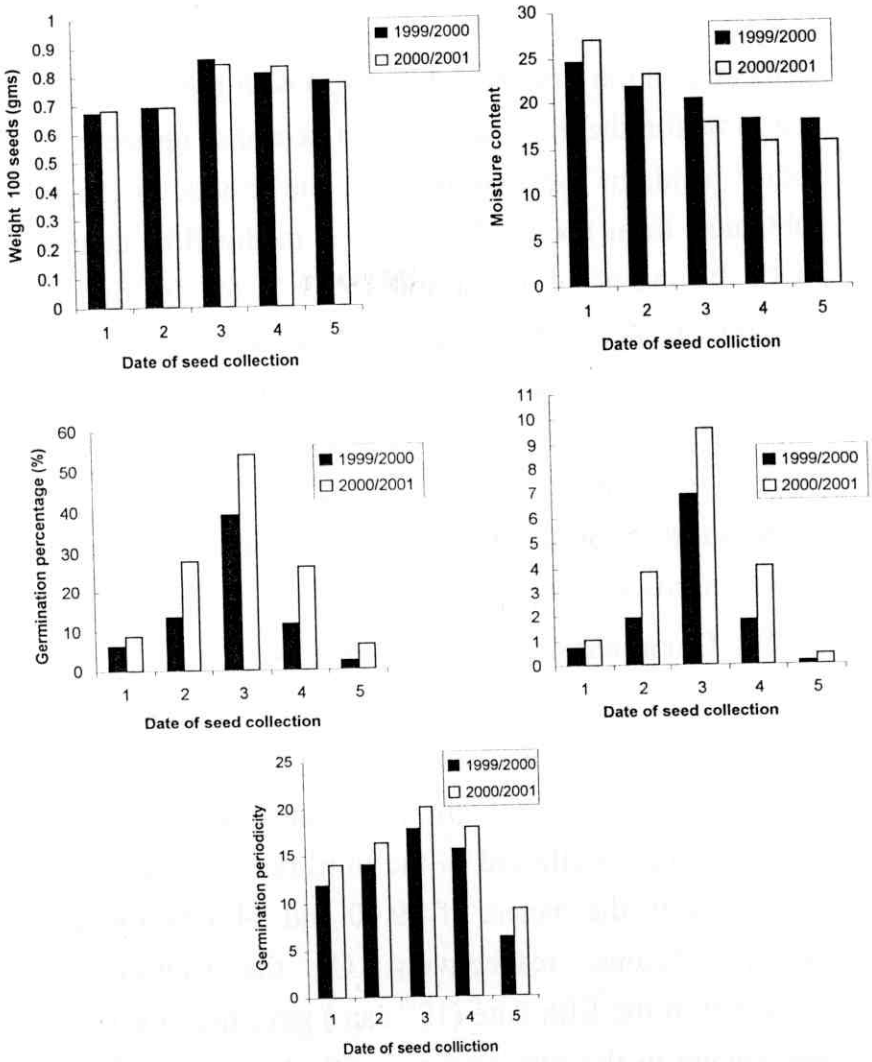


Figure (20): Effect of date of seed collection on the weight of 100 seeds, seed moisture (%), germination percentage, rate and periodicity of *Cupressus sempervirens* L. during 1999/2000 and 2000/2001 seasons.

P.N.:-(1) The first date (15th Sep.).
(2) The second date (15th Oct.).
(3) The third date (15th Nov.).
(4) The fourth date (15th Dec.).
(5) The fifth date (15th Jan.).

collected in the first date (15th Sep.) with the means of 24.64 and 26.97% for the first and second seasons, respectively. On the other hand, in the two seasons, the lowest moisture (%) was obtained from the seeds collected in the fifth date (15th Dec.) with the means of 17.96 and 15.63 % for the first and second seasons, respectively. The differences among the different dates of seeds collection which gave the highest and the lowest moisture (%) were significant in the two seasons. These results agreed with those of **Daniel *et al.* (1988)** on ***Astronium concinnum*** **Schott.** who found that when moisture content was > 60% seeds were non–viable.

C-2-3. Germination percentage (%):-

It is clear from Table (21) and Fig. (20) that, the germination percentage was affected with different dates of the seeds collection; the highest germination percentage resulted from the seeds collected in the third date (15th Nov.) in the two seasons with the means of 39.00 and 54.00% for the first and second seasons, respectively. On the contrary, the seeds collected in the fifth date (15th Jan.) gave the lowest germination percentage in the two seasons, with the means 2.25 and 6.25% for the first and second seasons, respectively. There are significant differences between the different dates of seeds collection on the seed germination percentage in the two seasons.

These results agree with those obtained **Barton (1965) and Pillay (1966)** who pointed out that dormancy and germination are the many plant growth responses that are probably controlled by the balance of growth inhibitors and promoters. This balance seems to be shifted in favour of the

inhibitory-substances during seed maturation, resulting in resting conditions. Also the finding of **Krawiarz (1973)** who reported that among the pericarp inhibitors phenols as salycilic, oxibenzoic, cinnamic and some other acids exist **(Bentley, 1958 and Lane and Bailey, 1964). Poincelot (1980)** indicated that germination inhibitors may be produced in the seed coat, the embryo, or the endosperm. They may also arise in the fruit and diffuse into the seed. **Sangakkara (1993)** on seeds of nutmeg *Myristica fragrans* Houtt. found that final germination percentages were 65, 75 and 90 % for fully mature, fully ripe and freshly fallen seeds, respectively. **Negi and Todaria (1995)** on seeds of 5 forest trees species (*Acer oblongum, Kydia calyciana, Terminalia chebula, T. tomentosa* and *T. belerica*) found that no germination was recorded in the first 2 collections of *K. Calycina* and the first collection of *T. tomentosa.* All species exhibited increased germination with time except for *T. chebula*, wich showed better germination (26.67%) at the third collection, while the other species performed better in the last collection. *A. oblongum* seeds started germinating in the first collection and maximum germination (83.33%) was recorded in the last. There were significant differences in the germination of different collection groups. In *T. Bellirica* maximum germination (96.67%) was recorded at the last collection. Germination was most in *T. bellirica* (96.67%) and least in *T. chebula* (26.67%).

C-2-4. Germination rate:

As shown in Table (21) and Fig. (20) the highest germination rate in the two seasons, was obtained from the seeds collected in the third date (15th Nov.) with the means of 6.93 and

9.59 for the first and second seasons, respectively. On the other hand, in the two seasons, the seeds collected in the fifth date (15th Jan.) gave the lowest germination rate as 0.14 and 0.42 for the first and second seasons, respectively. There are significant differences among the effect of the different dates of seeds collection on the seed germination rate in the two seasons.

These results agreed with those of **Jussey and Monin (1981)** who found that the seed coat inhibition in the dormant seed strains of Petunia which was due, presumably to chemicals moved from the coat to the endosperm and embryo.

C-2-5.Germination periodicity (days) :-

It is clear from Table(21) and Fig. (20) that the germination periodicity was affected with the different dates of the seed collection, in the two seasons. The highest germination periodicity in the two seasons, resulted from the seeds collected in the third date (15th Nov.) with the means of 17.77 and 20.26 days for the first and second seasons, respectively. On the other hand, in the two seasons, the lowest germination periodicity resulted from the seeds collected in the fifth date (15th Jan.) with the means of 6.22 and 9.22 days for the first and second seasons, respectively. The differences between the different dates of seeds collection which gave the highest and lowest germination periodicity were significant in the two seasons. These results agreed with those of **Bharathi (1996)** on neem *Azadirachta indica*, who found that for maximum vigour and viability of neem seeds, the drupes should be harvested when turn greensh-yellow (GY) in colour.

C-3. Effect of date of seed collection on the growth of *Cupressus sempervirens* L. seedlings at age of 9 months after sowing during 1999/2000 and 2000/2001 seasons:-

C-3-1. Plant height (cm):-

The plant height was influenced statistically with seeds collection in the different dates (Table 22 and Fig. 21). In the two seasons, the tallest seedlings resulted from the seeds collected in the second date (15th Oct.) with the means of 28.12 and 29.20 cm for the first and second seasons, respectively. On the other hand , in the first season, the seeds collected in the fourth (15th Dec.) and the fifth date (15th Jan.) gave the shortest seedlings with the means of 15.58 and 15.75 cm, respectively. While, in the second season, the shortest seedlings were obtained from the seeds collected in the first (15th Sep.) and the fifth date (15th Jan.) with the means of 16.42 and 17.24 cm, respectively. The differences between the dates of the seeds collection which gave the tallest and the shortest seedlings were significant in the two seasons.

The increase in the length of seedlings from the seeds collected in second date (15th Oct.) may by due to high rate of sugars accumulation in embryo cells which led to the disappear of some growth inhibitors, as these results agreed with those of **Krawiarz (1973)** who showed that among the pericarp inhibitors phenols and other compounds. Such compounds may release by time after harvesting.

C-3-2. Number of leaves/plant:-

From Table (22) and Fig. (21) show clearly that, the highest number of leaves on seedlings was obtained from the

Table (22):-Effect of date of seed collection on the growth of *Cupressus sempervirens* L. seedlings at age of 9 months after sowing during 1999/2000 and 2000/2001 seasons.

Seasons	1999/2000				2000/2001			
Date of seed collection	Plant height (cm)	Number of leave/ plant	Thickness of stem/ plant (mm)	Root length/ plant (cm)	Plant height (cm)	Number of leaves/ plant	Thickness of stem/ plant (mm)	Roots length/ plant (cm)
D(I) 15th Sep.	16.26	17.35	2.26	44.21	16.42	17.58	2.26	41.99
D(II) 15th Oct.	28.12	29.35	2.57	50.34	29.20	31.84	2.63	30.95
D(III) 15thNov.	19.44	23.61	2.35	67.83	23.01	26.64	2.16	23.45
D(IV) 15th Dec.	15.58	19.31	1.69	27.77	23.22	28.10	2.32	24.32
D(V) 15th Jan.	15.75	23.13	1.84	22.67	17.24	21.62	1.88	18.13
L.S.D. at 5%	2.46	2.62	0.30	4.80	1.66	2.39	0.11	4.05

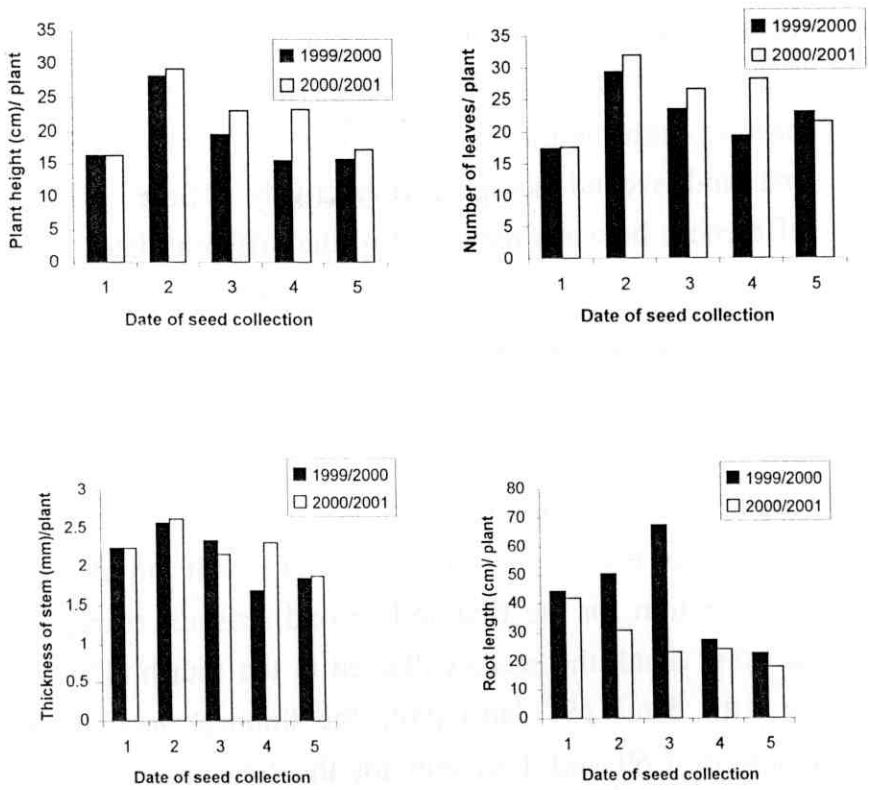


Figure (21): Effect of date of the seed collection on the growth of *Cupressus sempervirens* L. seedlings at age of 9 months after sowing during 1999/2000 and 2000/2001 seasons.

P.N.:-(1) The first date (15th Sep.).
(2) The second date (15th Oct.).
(3) The third date (15th Nov.).
(4) The fourth date (15th Dec.).
(5) The fifth date (15th Jan.).

seeds collected in the second date (15th Oct.) in the two seasons, with means of 29.35 and 31.84 leaves/plant for the first and second seasons, respectively. While, the seeds collected in the first date (15th Sep.) gave the lowest number of leaves in the two seasons, with the means of 17.35 and 17.58 leaves/plant for the first and second seasons, respectively. There are significant differences between the effect of the different dates of the seeds collection on the number of leaves in the two seasons.

C-3-3. Thickness of stem (mm):-

Data in Table (22) and Fig. (21) show, the effect of the seed collection in the different dates on the thickness of stem. The thickest seedling in the two seasons, resulted from the seeds collected in the second date (15th Oct.) with the means of 2.57 and 2.63 mm for the first and second seasons, respectively. On the other hand, the seeds collected in the fourth (15th Dec.) and the fifth date (15th Jan.) gave the thinnest seedling with the means of 1.69 and 1.84 mm for the first season, respectively. While, the thinnest seedlings were obtained from the seeds collected in the fifth date (15th Jan.) with the mean of 1.88 mm for the second season. The differences among the effect of the different dates of seeds collection which gave the thickest and thinnest seedling were significant in the two seasons.

C-3-4. Root length (cm):-

The root length (Table 22 and Fig. 21) was affected with the seed collection in different dates. The tallest roots resulted from the seeds collected in the third date (15th Nov.) with the mean of 67.83 cm for the first season. While, the seeds collected in the first date (15th Sep.) gave the tallest root with the mean of

41.99 cm for the second season. On the contrary, the shortest roots resulted from the seeds collected in the fifth date (15th Jan.) with the means 22.67 and 18.13 cm for the first and second seasons, respectively. There are significant differences between the effect of the different dates of seeds collection on the root length in the two seasons.

C-4. Effect of date of seed collection on the fresh weight of *Cupressus sempervirens* L. seedlings at age of 9 months after sowing during 1999/2000 and 2000/2001 seasons:-

C-4-1. Fresh weight of the stem (gm):-

It is evident from table (23) and Fig. (22) that the heaviest fresh weight of the stem was obtained from the seeds collected in the second date (15th Oct.) in the two seasons, with the means of 0.65 and 0.79 gm for the first and second season, respectively. On the other hand, in the first season, the lightest fresh weight of the stem resulted from the seeds collected in the fourth date (15th Dec) with the mean of 0.29 gm. While, in the second seasons, the seeds collected in the third (15th Nov.) and the fifth date (15th Jan.) gave the lightest fresh weight of the stems with the mean of 0.35 gm for each. The differences between the dates of seeds collection which gave the heaviest fresh weight of the stem and the lightest weight of stem were significant in the two seasons.

C-4-2. Fresh weigh of the leaves (gm):-

Table (23) and Fig. (22) show the effect of seeds collection in the different dates on the fresh weight of the leaves for the two seasons. The heaviest fresh weight of leaves resulted from the seed collected in the second date (15th Oct) in the two season, with the means of 1.57 and 1.66 gm for the first and

Table (23):-Effect of date of seed collection on the fresh weight (gm) of *Cupressus sempervirenus* L. seedlings at age of 9 months after sowing during 1999/2000 and 2000/2001 seasons.

Seasons	1999/2000			2000/2001		
Date of seed collection	Fresh weight (g/plant)			Fresh weight (g/plant)		
	Stem	Leaves	Roots	Stem	Leaves	Roots
D(I) 15th Sep.	0.38	0.64	0.36	0.37	0.64	0.33
D(II) 15th Oct.	0.65	1.57	0.57	0.79	1.66	0.66
D(III) 15thNov.	0.35	0.76	0.47	0.35	1.05	0.24
D(IV) 15th Dec.	0.29	0.42	0.22	0.43	1.17	0.28
D(V) 15th Jan.	0.43	0.47	0.20	0.35	0.51	0.33
L.S.D. at 5%	0.07	0.23	0.08	0.07	0.17	0.05

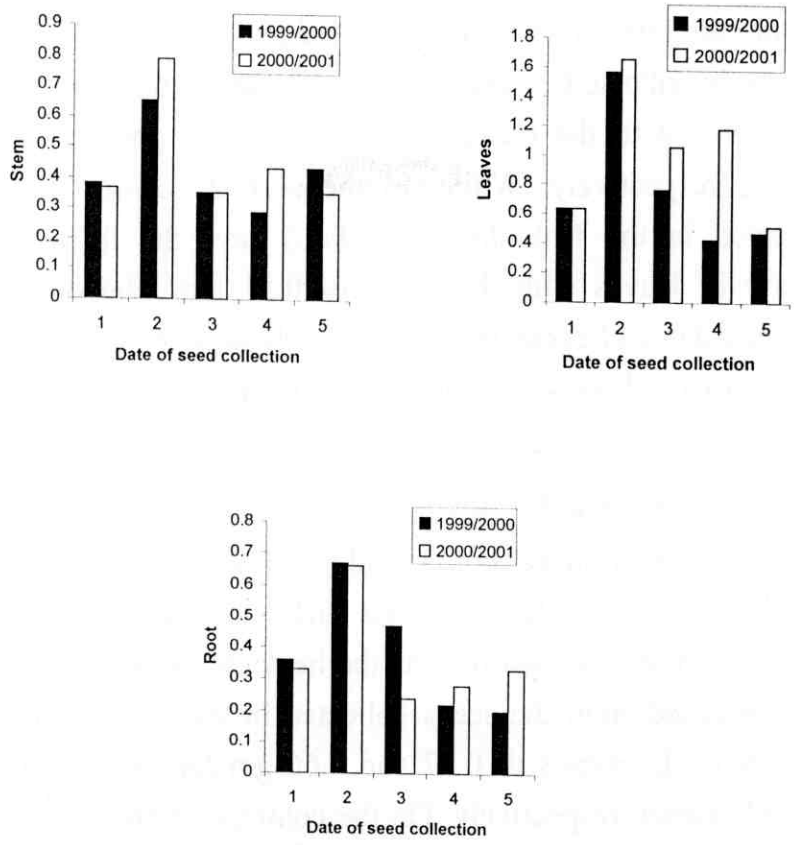


Figure (22):Effect of date of the seed collection on the fresh weight (gm) of *Cupressus sempervirenus* L. seedlings at age of 9 months after sowing during 1999/2000 and 2000/2001 seasons.

P.N.:-(1) The first date (15th Sep.).
(2) The second date (15th Oct.).
(3) The third date (15th Nov.).
(4) The fourth date (15th Dec.).
(5) The fifth date (15th Jan.).

second seasons, respectively. On the other hand, in the first season, the lightest fresh weight of the leaves was obtained from the seeds collected in the fourth (15th Dec.) and the fifth date (15th Jan.) with the means of 0.42 and 0.47 gm for the first season, respectively. While, in the second season, the seeds collected in the fifth date (15th Jan.) gave the lightest fresh weight of leaves with the mean of 0.51 gm. The differences between dates of seeds collection which gave the heaviest fresh weight of the leaves and the lightest fresh weight of the leaves were significant in the two seasons.

C-4-3. Fresh weight of the roots (gm):-

As shown in Table (23) and Fig. (22), the fresh weight of the roots was affected with the different dates of the seeds collected in the two seasons; as the heaviest fresh weight of the roots resulted from the seeds collected in the second date (15th Oct.) with the means of 0.57 and 0.66 gm for the first and the second season, respectively. On the contrary, in the first season, the seeds collected in the fourth (15th Dec.) and the fifth date (15th Jan.) gave the lightest fresh weight with the means of 0.22 and 0.20 gm for the first season, respectively. While, in the second season, the lightest fresh weight of the roots resulted from the seeds collected in the third (15th Nov.) and the fourth date (15th Dec.) with means of 0.24 and 0.28 gm respectively. The differences between dates of the seeds collection which gave the heaviest fresh weight of the roots and the lightest fresh weight of the roots were significant in the two seasons.

C-5. Effect of date of seed collection on the dry weight of *Cupressus sempervirens* L. seedlings at age of 9 months after sowing during 1999/2000 and 2000/2001 seasons:-

C-5-1. Dry weight of the stem (gm):-

Generally, the dry weight of the stem took a similar trend as that in the fresh weight of stem (Table 24 and Fig. 23). The heaviest dry weigh of stem was obtained from the seeds collected in the second date (15th Oct.) in the two seasons with the means of 0.43 and 0.44 gm for the first and second seasons, respectively. On other hand, in the two seasons, the seeds collected in the fifth date (15th Jan.) gave the lightest fresh weight of stems with the means of 0.12 and 0.11 gm for the first and second season, respectively. The differences between the dates of seeds collection which gave the heaviest and the lightest fresh weight of stem were significant in the two seasons.

C-5-2. Dry weight of the leaves (gm):-

As shown in Table (24) and Fig.(23) the dry weight of leaves was affected with the different dates of the seeds collection. The heaviest dry weight of the leaves resulted from the seeds collected in the second date (15th Oct.) in the two seasons, with the means of 0.63 and 0.65 gm for the first and second season, respectively. On the other hand, the seeds collected in the fifth date (15th Jan.) gave the lightest dry weight of the leaves with the means of 0.20 and 0.18 gm for the first and second season, respectively. The differences between the dates of seeds collection which gave the heaviest dry weight of leaves and the lightest dry weight were significant in the two season.

Table (24):-Effect of date of seed collection on the dry weight (gm) of *Cupressus sempervirenus* L. seedlings at age of 9 months after sowing during 1999/2000 and 2000/2001 seasons.

Seasons	1999/2000			2000/2001		
Date of seed collection	Dry weight (g/plant)			Dry weight (g/plant)		
	Stem	Leaves	Roots	Stem	Leaves	Roots
D(I) 15th Sep.	0.27	0.43	0.25	0.28	0.43	0.24
D(II) 15th Oct.	0.43	0.63	0.34	0.44	0.65	0.34
D(III) 15thNov.	0.30	0.35	0.26	0.20	0.38	0.15
D(IV) 15th Dec.	0.13	0.25	0.12	0.23	0.40	0.14
D(V) 15th Jan.	0.12	0.20	0.13	0.11	0.18	0.11
L.S.D. at 5%	0.04	0.03	0.02	0.07	0.09	0.05

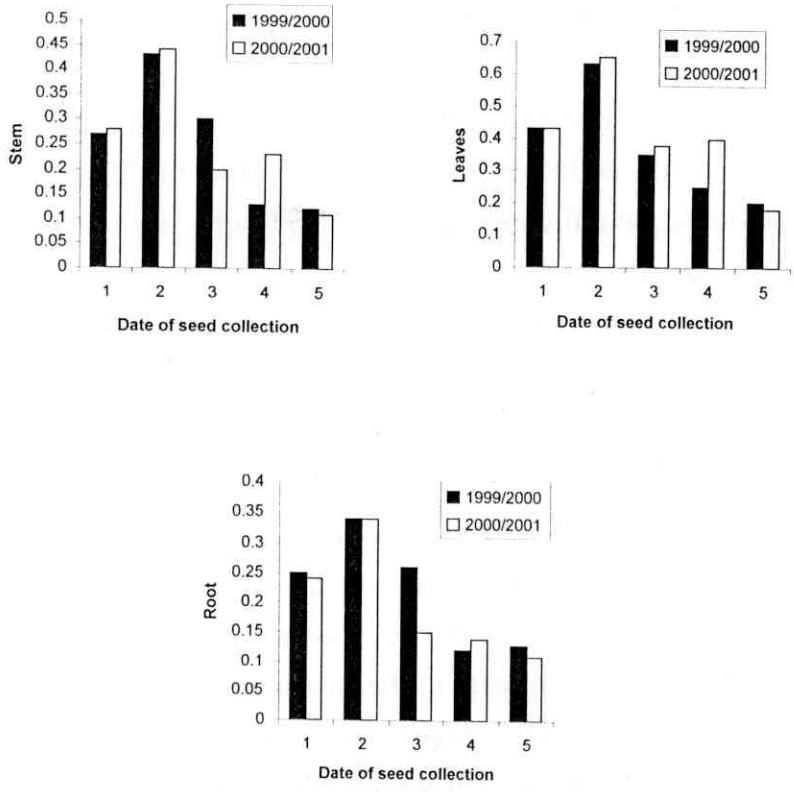


Figure (23): Effect of date of the seed collection on the dry weight (gm) *Cupressus sempervirenus* L. seedlings at age of 9 months after sowing during 1999/2000 and 2000/2001 seasons.

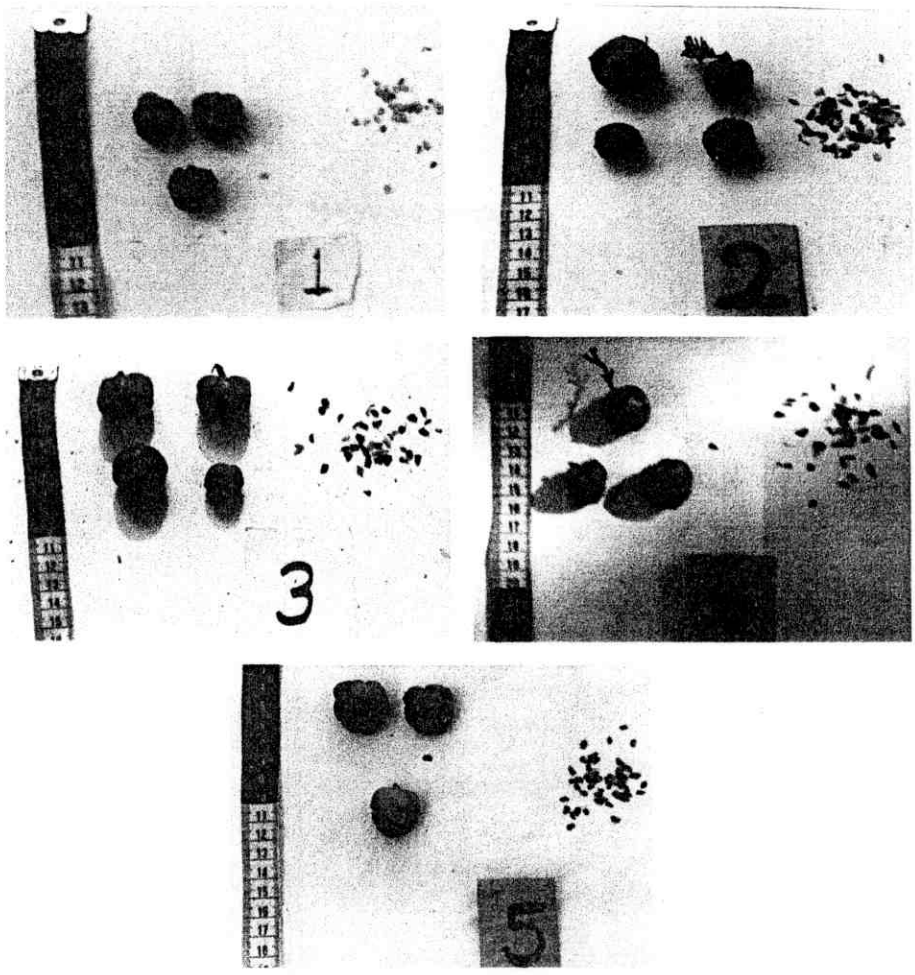
P.N.:-(1) The first date (15th Sep.).
(2) The second date (15th Oct.).
(3) The third date (15th Nov.).
(4) The fourth date (15th Dec.).
(5) The fifth date (15th Jan.).

C-5-3. Dry weight of the roots (gm):-

As shown in Table (24) and Fig.(23), dry weight of roots was markedly affected by seed collection in the different dates. The seeds collected in the second date (15thDct.) in the two seasons, gave the heaviest dry weight of roots with the mean of 0.34 gm for each. On the contrary, the lightest dry weight of roots resulted from the seeds collected in the fourth (15th Dec.) and the fifth date (15th Jan.) in the first season with the means of 0.13 and 0.12 gm for the first season, respectively. While, the lightest dry weight of roots in the second season, resulted from the seeds collected in the fifth date (15th Jan.) with the mean of 0.11 gm. The difference among the different dates of the seeds collection which gave the heaviest roots and lightest dry weight of roots were significant in the two seasons.

The above data proved that dates of seed collection had different effects on seed germination. This fact is dependent on the variation of genera. Also, the effects of harvesting dates extend on the growth of seedlings.

The suitable harvesting dates were the fifth date (15th Mar.) for ***Albizzia lebbeck*** **Benth.**; the third date (15th Nov.) for ***Taxodium distichum*** **(L.) Rich.** as well as the third date (15th Nov.) for ***Cupressus sempervirens*** **L.** which must be recommended for better germination. However, the suitable harvesting dates as the second date (15th Dec.) for ***Albizzia lebbeck*** **Benth.**; the second date (15th Oct.) for ***Taxodium distichum*** **(L.) Rich.** and the second date (15th Oct.) for ***Cupressus sempervirens*** **L.** must be recommended for better growth of seedlings. This is true if the sources are from the similar location.



Photog. (10): Effect of the date of seed collection on the seeds color of *Cupressus sempervirens* L.

P.N.: **(1)** The first date (15th Sep.).
(2) The second date (15th Oct.).
(3) The third date (15th Nov.).
(4) The fourth date (15th Dec.).
(5) The fifth date (15th Jan.).